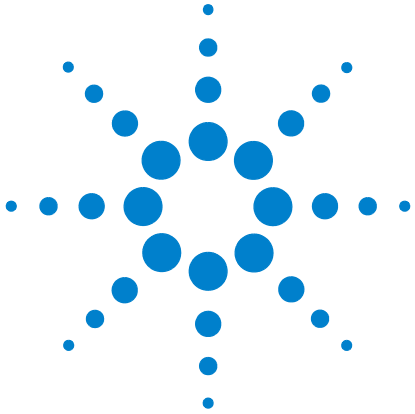


Agilent N9360A
Multi UE Tester

GSM User Manual

Agilent Technologies

Notices

© Agilent Technologies, Inc. 2006

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Agilent Technologies, Inc. as governed by United States and international copyright laws.

Manual Part Number

N9360-90700

Edition

First Edition, May 2006

Printed in Malaysia

Agilent Technologies Microwave Products (Malaysia) Sdn. Bhd.
Bayan Lepas Free Industrial Zone
11900 Penang, Malaysia

Warranty

The material contained in this document is provided "as is," and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Restricted Rights Legend

If software is for use in the performance of a U.S. Government prime contract or subcontract, Software is delivered and licensed as "Commercial computer software" as defined in DFAR 252.227-7014 defined in FAR 2.101(a) or as "Restricted computer software" as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause. Use, duplication or disclosure of Software is subject to Agilent Technologies' standard commercial license terms, and non-DOD Departments and Agencies of the U.S. Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2) (June 1987). U.S. Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2) (November 1995), as applicable in any technical data.

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Preface

Thank-you for purchasing the Agilent N9360A. GSM (Global System for Mobile Communication). This is the GSM software for the N9360A Multi UE Tester.

- Before using the tester, the user is advised to read this manual carefully to ensure correct usage and also to fully utilize the tester capability.
- This manual is a reference document and the user is advised to keep it carefully for future reference.
- The manual includes the characteristics of GSM, the tester operation, test procedures and screen references.
- Refer to the *N9360A Multi UE Tester Installation Guide* for information regarding installation and details of the tester. Refer also to the *N9360A W-CDMA User Manual* for information about the test functions of W-CDMA (Wideband Code Division Multiple Access).

Notation

The following notations are used in this manual:

- **Softkey** : indicates a softkey;
- [Screen Name] : indicates a screen name;
- Tester/tester : indicates the N9360A Multi UE Tester.

Notices

- The information contained in this manual is subjected to change with notice.
- No part of this manual may be reproduced either mechanically, electronically or otherwise, without permission from Agilent Technologies, Inc.

Trademarks

- Ethernet is the registered trademark of the Xerox Corporation.
- EPSON is the registered trademark of the EPSON Corporation.
- Other product names and companies used herein are trademarks or registered trademarks of their respective companies or Agilent Technologies, Inc. For registered trademarks, the trademarks symbols ® and ™ are omitted in this manual.

THIS PAGE IS INTENTIONALLY LEFT BLANK

Contents

Preface 1-3
Notation 1-3
Notices 1-3
Trademarks 1-3

1 Legal Information

Legal Information 1-2
Warranty 1-2
Technology Licenses 1-2
Restricted Rights Legend 1-2
Service And Support 1-3
Agilent On The Web 1-3
Agilent By Phone 1-3

2 Caution and Safety Requirements

Safety Information 2-2
Safety Summary 2-2
Safety Notices 2-2
Warning Label 2-2
General 2-3
When Operating The Tester 2-3

3 Overview

Functions 3-2
Features 3-4
Standard Configuration 3-5
Accessories 3-6

4 Operating Procedures

Test Flow 4-2
Preparation for Each Test 4-3
Connection 4-4
Test Procedure 4-5
Ending a Test 4-87

5 Screen Reference

Screen Flow Chart 5-2
Top Menu Screen 5-3
Firmware Update Screen 5-10
Initial Screen 5-12
Return to Menu Screen 5-15

Automatic Test 5-16
Manual Test (GSM Mode) 5-45
Manual Test (GPRS Mode) 5-78
Manual Test (EGPRS Mode) 5-104
TX Analyzer 5-137
Signal Generator 5-166
Configuration 5-168
Configuration: Test Condition Screen 5-176

6 Troubleshooting

Item to be checked 6-2
Error Information 6-6

7 Performance and Specifications

Measurement Performance 7-2

8 Appendix A Input Fields and Allowable Choices or Ranges

9 Appendix B General Information in the GSM System

The GSM System 9-2

10 Appendix C CAU-17 Antenna Coupler

Introduction 10-2
Specifications 10-2
Operating the Antenna Coupler 10-3

List Of Figures

4 Operating Procedures

Figure 4-1. Test Flow 4-2
Figure 4-2. Typical Test Setup of the Tester 4-3
Figure 4-3. Connecting a Printer 4-5
Figure 4-4. Display Annotation 4-6
Figure 4-5. Value Storage Softkeys 4-9
Figure 4-6. Memory Function 4-10
Figure 4-7. Value Storage Softkeys 4-12
Figure 4-8. Changing Magnification Softkey 4-13
Figure 4-9. [Top Menu] Screen 4-14
Figure 4-10. [Initial] Screen 4-15
Figure 4-11. [Initial] Screen 4-16
Figure 4-12. [Configuration] Screen 4-20
Figure 4-13. [Configuration: Test Sequence] Screen 4-22
Figure 4-14. [Initial] Screen 4-23
Figure 4-15. [Configuration] Screen 4-24
Figure 4-16. [Configuration: Test Sequence] Screen 4-25
Figure 4-17. [Configuration: Test Condition] Screen 4-26
Figure 4-18. [Automatic Test: Stand-by] Screen 4-27
Figure 4-19. [Automatic Test: Stand-by] Value Screen 4-28
Figure 4-20. [Stand-by] Summary Screen 4-30
Figure 4-21. [Stand-by] Graph/Value Screen 4-31
Figure 4-22. [Initial] Screen 4-32
Figure 4-23. [Configuration] Screen 4-33
Figure 4-24. [Configuration: Test Condition] Screen 4-34
Figure 4-25. [Manual Test: Stand-by] Screen (GSM Mode) 4-35
Figure 4-26. [Measuring] MS Call Screen (GSM Mode) 4-36
Figure 4-27. [Measuring] Summary Screen (GSM Mode) 4-37
Figure 4-28. [Measuring] Graph/ Value Screen (GSM Mode) 4-38
Figure 4-29. [Measuring] Graph/Value Zoomed Screen (GSM Mode) 4-39
Figure 4-30. [Measuring] Spectrum Monitor Screen (GSM Mode) 4-40
Figure 4-31. [Stand-by] After Release Screen (GSM Mode) 4-41
Figure 4-32. [Initial] Screen 4-42
Figure 4-33. [Configuration] Screen 4-43
Figure 4-34. [Configuration: Test Condition] Screen 4-44
Figure 4-35. [Manual Test: Stand-by] Screen (GSM Mode) 4-45
Figure 4-36. [Measuring] BS Call Screen (GSM Mode) 4-46
Figure 4-37. [Measuring] Summary Screen (GSM Mode) 4-47
Figure 4-38. [Stand-by] After Release Screen (GSM Mode) 4-48
Figure 4-39. [Initial] Screen 4-49

Figure 4-40. [Configuration] Screen 4-50
Figure 4-41. [Configuration: Test Condition] Screen 4-51
Figure 4-42. [Manual Test: Stand-by] Screen (GSM Mode) 4-52
Figure 4-43. [Measuring] MS Call Emergency Call Screen (GSM Mode) 4-53
Figure 4-44. [Measuring] Emergency Call Summary Screen (GSM Mode) 4-54
Figure 4-45. [Stand-by] After Release Screen (GSM Mode) 4-55
Figure 4-46. [Initial] Screen 4-56
Figure 4-47. [Configuration] Screen 4-57
Figure 4-48. [Configuration: Test Condition] Screen 4-58
Figure 4-49. [Manual Test: Stand-by] GPRS Mode Screen 4-59
Figure 4-50. [Measuring] Attached Screen (GPRS Mode) 4-60
Figure 4-51. [Measuring] Connected Screen (GPRS Mode) 4-61
Figure 4-52. [Measuring] Summary Screen (GPRS Mode) 4-62
Figure 4-53. [Measuring] Graph/Value Screen (GPRS Mode) 4-63
Figure 4-54. [Measuring] Graph/Value Zoomed Screen (GPRS Mode) 4-64
Figure 4-55. [Measuring] Spectrum Monitor Screen (GPRS Mode) 4-65
Figure 4-56. [Initial] Screen 4-66
Figure 4-57. [Configuration] Screen 4-67
Figure 4-58. [Configuration: Test Condition] Screen 4-68
Figure 4-59. [Manual Test: Stand-by] EGPRS Mode Screen 4-69
Figure 4-60. [Measuring] Attached Screen (EGPRS Mode) 4-70
Figure 4-61. [Measuring] Connected Screen (EGPRS Mode) 4-71
Figure 4-62. [Measuring] Summary Screen (EGPRS Mode) 4-72
Figure 4-63. [Measuring] Graph/Value Screen (EGPRS Mode) 4-73
Figure 4-64. [Measuring] Graph/Value Zoomed Screen (EGPRS Mode) 4-74
Figure 4-65. [Measuring] Spectrum Monitor Screen (EGPRS Mode) 4-75
Figure 4-66. [Initial] Screen 4-76
Figure 4-67. [Configuration] Screen 4-77
Figure 4-68. [Configuration: Test Condition] Screen 4-78
Figure 4-69. [TX Analyzer: Stand-by] Screen 4-79
Figure 4-70. [Stand-by] Summary Screen 4-80
Figure 4-71. [Stand-by] Graph/Value Screen 4-81
Figure 4-72. [Stand-by] Graph/Value Zoom Screen 4-82
Figure 4-73. [Stand-by] Spectrum Monitor Screen 4-83
Figure 4-74. [Initial] Screen 4-84
Figure 4-75. [Configuration] Screen 4-85
Figure 4-76. [Signal Generator] Screen 4-86

5 Screen Reference

Figure 5-1. Screen Flow Chart 5-2
Figure 5-2. Selectable Systems 5-3
Figure 5-3. [Top Menu] Screen 5-4
Figure 5-4. [Configuration] Screen 5-6
Figure 5-5. Part of [Configuration] screen (without Option E00) 5-7
Figure 5-6. Part of [Configuration] screen (without Option E01) 5-7
Figure 5-7. [Firmware Update] Screen 5-11
Figure 5-8. [Initial] Screen 5-13
Figure 5-9. [Return to Menu] Screen 5-15
Figure 5-10. [Automatic Test: Stand-by] Simplified Screen 5-17
Figure 5-11. [Automatic Test: Stand-by] Detailed Screen 5-17
Figure 5-12. [Automatic Test: Stand-by] Value Screen 5-18
Figure 5-13. [Measuring] Simplified Screen 5-23
Figure 5-14. [Measuring] Detailed Screen 5-23
Figure 5-15. [Measuring] Value Screen 5-24
Figure 5-16. [Measuring] Talk Simplified Screen 5-26
Figure 5-17. [Measuring] Talk Detailed Screen 5-26
Figure 5-18. [Measuring] Talk Value Screen 5-27
Figure 5-19. [Stand-by] Aborted Simplified Screen 5-29
Figure 5-20. [Measuring] Next Sequence 2 Screen 5-31
Figure 5-21. [Stand-by] Summary Simplified Screen 5-33
Figure 5-22. [Stand-by] Summary Detailed Screen 5-33
Figure 5-23. [Stand-by] Summary Value Screen 5-34
Figure 5-24. [Stand-by] Peak TX Power Screen 5-37
Figure 5-25. [Stand-by] Burst Timing/ Power Ramp Screen 5-39
Figure 5-26. [Stand-by] Burst Timing/ Power Ramp Zoomed Screen 5-40
Figure 5-27. [Stand-by] Phase Error Screen 5-42
Figure 5-28. [Stand-by] Sensitivity/ RX Quality/ RX Level Screen 5-44
Figure 5-29. [Manual Test: Stand-by] GSM Mode Screen 5-46
Figure 5-30. [Manual Test: Measuring] MS Call Screen 5-51
Figure 5-31. [Measuring] BS Call Connection Screen 5-52
Figure 5-32. [Measuring] MS Call Connection Screen 5-52
Figure 5-33. [Measuring] BS Call Screen 5-56
Figure 5-34. [Measuring] MS Call Screen 5-57
Figure 5-35. [Stand-by] BS Call Summary Screen 5-58
Figure 5-36. [Stand-by] MS Call Summary Screen 5-59
Figure 5-37. [Measuring] Peak TX Power/Burst Timing/Power Ramp Screen 5-61
Figure 5-38. [Measuring] Peak TX Power/ Burst Timing/ Power Ramp Zoomed Screen 5-62
Figure 5-39. [Measuring] Phase Error/ Frequency Error Screen 5-65

Figure 5-40. [Measuring] Sensitivity/ RX Quality/ RX Level Screen 5-68
Figure 5-41. [Measuring] Spectrum Monitor Screen 5-72
Figure 5-42. [Stand-by] SMS Screen 5-75
Figure 5-43. [Manual Test: Stand-by] GPRS Mode Screen 5-80
Figure 5-44. [Measuring] Attached Screen 5-84
Figure 5-45. [Measuring] Connected Screen 5-87
Figure 5-46. [Stand-by] Summary Screen 5-88
Figure 5-47. [Measuring] Peak TX Power/ Burst Timing/ Power Ramp Screen 5-91
Figure 5-48. [Measuring] Peak TX Power/ Burst Timing/ Power Ramp Zoomed Screen 5-91
Figure 5-49. [Measuring] Phase Error/ Frequency Error Screen 5-95
Figure 5-50. [Measuring] Sensitivity in BLER Screen 5-98
Figure 5-51. [Measuring] Spectrum Monitor Screen 5-101
Figure 5-52. [Manual Test: Stand-by] EGPRS Mode Screen 5-106
Figure 5-53. [Measuring] Attached Screen 5-110
Figure 5-54. [Measuring] Connected Screen 5-113
Figure 5-55. [Stand-by] Summary Screen 5-115
Figure 5-56. [Measuring] Peak TX Power/ Burst Timing/ Power Ramp Screen 5-117
Figure 5-57. [Measuring] Peak TX Power/ Burst Timing/ Power Ramp Zoomed Screen 5-118
Figure 5-58. [Measuring] Phase Error/ Frequency Error Screen 5-121
Figure 5-59. [Measuring] EVM Screen 5-125
Figure 5-60. [Measuring] Sensitivity in BLER Screen 5-128
Figure 5-61. [Output RF Spectrum] Screen 5-131
Figure 5-62. [Measuring] Spectrum Monitor Screen 5-134
Figure 5-63. [TX Analyzer: Stand-by] Screen 5-138
Figure 5-64. [Measuring] Screen 5-142
Figure 5-65. [Stand-by] Summary Screen 5-143
Figure 5-66. [Stand-by] Peak TX Power/ Burst Timing/ Power Ramp Screen 5-145
Figure 5-67. [Stand-by] Peak TX Power/ Burst Timing/ Power Ramp Zoomed Screen 5-146
Figure 5-68. [Stand-by] Phase Error/ Frequency Error Screen 5-150
Figure 5-69. [Stand-by] EVM Frequency Error/OOS Screen 5-154
Figure 5-70. [Output RF Spectrum] Screen 5-158
Figure 5-71. [Stand-by] Spectrum Monitor Span 0 - 400kHz Screen 5-161
Figure 5-72. [Stand-by] Spectrum Monitor Span +-100kHz Screen 5-163
Figure 5-73. [Signal Generator] Screen 5-167
Figure 5-74. [Configuration] Screen 5-169
Figure 5-75. [Configuration: Test Sequence] Screen 5-173

Figure 5-76. [Configuration: Test Condition] (GSM Mode) Screen 5-177
Figure 5-77. [Configuration: Test Condition] (GPRS Mode) Screen 5-178
Figure 5-78. [Configuration: File Management] Screen 5-183
Figure 5-79. [Configuration: File Management] Save-1 Screen 5-185
Figure 5-80. [Configuration: File Management] Save-2 Screen 5-186
Figure 5-81. [Configuration: File Management] Save-3 Screen 5-187
Figure 5-82. [Configuration: File Management] Save-4 Screen 5-188
Figure 5-83. [Configuration: File management] Save-5 Screen 5-189
Figure 5-84. [Configuration: File Management] Recall-1 Screen 5-191
Figure 5-85. [Configuration: File Management] Recall-2 Screen 5-192
Figure 5-86. [Configuration: File Management] Recall-3 Screen 5-193
Figure 5-87. [Configuration: File Management] Delete-1 Screen 5-194
Figure 5-88. [Configuration: File Management] Delete-2 Screen 5-195
Figure 5-89. [Configuration: File Management] Delete-3 Screen 5-196
Figure 5-90. [Configuration: File Management] Replace-1 Screen 5-197
Figure 5-91. [Configuration: File Management] Replace-2 Screen 5-198
Figure 5-92. [Configuration: File Management] Replace-3 Screen 5-199

6 Troubleshooting

Figure 6-1. An Example of [Error] Screens 6-7

THIS PAGE IS INTENTIONALLY LEFT BLANK.

List Of Tables

1 Legal Information

Table 1-1. Agilent Call Centers and Regional Headquarters 1-3

3 Overview

Table 3-1. Main Functions 3-2
Table 3-2. Configuration 3-5
Table 3-3. Accessories 3-6

4 Operating Procedures

Table 4-1. Description of the Display Annotation 4-6

5 Screen Reference

Table 5-1. [Configuration] Screen Input Field 5-7
Table 5-2. [Initial] Screen Input Field 5-14
Table 5-3. [Automatic Test: Stand-by] Screen Input Field 5-19
Table 5-4. Automatic Test Measurement Item 5-20
Table 5-5. [Automatic Test: Stand-by] Screen Mobile Phone Information 5-21
Table 5-6. [Automatic Test: Measuring] Screen Mobile Phone Information 5-25
Table 5-7. [Automatic Test: Stand-by] Summary Screen Input Field 5-35
Table 5-8. [Automatic Test: Measuring] Screen Mobile Phone Information 5-36
Table 5-9. [Automatic Test] Peak TX Power Screen Field 5-38
Table 5-10. [Automatic Test] Burst Timing/Power Ramp Screen Field 5-41
Table 5-11. [Automatic Test] Phase Error/Frequency Error Screen Field 5-43
Table 5-12. [Automatic Test] Phase Error/Frequency Error Screen Field 5-44
Table 5-13. [Manual Test: Stand-by] Screen GSM Mode Input Field 5-47
Table 5-14. Manual Test GSM Mode Measurement Item 5-49
Table 5-15. [Manual Test: Stand-by] GSM Mode Screen Mobile Phone Information 5-49
Table 5-16. [Manual Test: Stand-by] Screen GSM Mode Input Field 5-53
Table 5-17. [Manual Test: Measuring] GSM Mode Connection Screen Mobile Phone Information 5-54
Table 5-18. [Manual Test: Stand-by] Screen GSM Mode Input Field 5-63

Table 5-19. [Manual Test] GSM Mode Peak TX Power/Burst Timing/Power Ramp Screen Field 5-64
Table 5-20. [Manual Test] GSM Mode Phase Error/Frequency Error Input Field 5-67
Table 5-21. [Manual Test] GSM Mode Phase Error/Frequency Error Screen Field 5-68
Table 5-22. [Manual Test] GSM Mode Sensitivity/ RX Quality/ RX Level Screen Input Field 5-69
Table 5-23. [Manual Test] GSM Mode Sensitivity/RX Quality/RX Level Screen Field 5-71
Table 5-24. [Manual Test] GSM Mode Spectrum Monitor Screen Input Field 5-73
Table 5-25. [Manual Test] GSM Mode Sensitivity/RX Quality/RX Level Screen Field 5-74
Table 5-26. [Manual Test] GSM Mode SMS Screen Input Field 5-76
Table 5-27. [Manual Test] GSM Mode SMS Information 5-77
Table 5-28. Slot Configuration and Measurement Slot 5-79
Table 5-29. [Manual Test: Stand-by] GPRS Mode Screen Input Field 5-81
Table 5-30. Manual Test GPRS Mode Measurement Item 5-82
Table 5-31. Manual Test GPRS Mode Measurement Item 5-83
Table 5-32. [Manual Test: Measuring] GPRS Mode Screen Input Field 5-85
Table 5-33. [Manual Test] GPRS Mode Attached Screen Mobile Phone Information 5-86
Table 5-34. [Manual Test] GPRS Mode Peak TX Power/ Burst Timing/Power Ramp Screen Input Field 5-93
Table 5-35. [Manual Test] GPRS Mode Peak TX Power/Burst Timing/Power Ramp Screen Field 5-94
Table 5-36. [Manual Test] GPRS Mode Phase Error/Frequency Error Screen Input Field 5-96
Table 5-37. [Manual Test] GPRS Mode Phase Error/Frequency Error Screen Field 5-97
Table 5-38. [Manual Test] GPRS Mode Sensitivity Screen Input Field 5-99
Table 5-39. [Manual Test] GPRS Mode Sensitivity Screen Field 5-100
Table 5-40. [Manual Test] GPRS Mode Spectrum Monitor Screen Input Field 5-102
Table 5-41. [Manual Test] GPRS Mode Spectrum Monitor Screen Field 5-103
Table 5-42. Slot Configuration and Measurement Slot 5-104
Table 5-43. [Manual Test: Stand-by] EGPRS Mode Screen Input Field 5-107
Table 5-44. Manual Test EGPRS Mode Measurement Item 5-108
Table 5-45. Manual Test EGPRS Mode Measurement Item 5-109

Table 5-46. [Manual Test: Measuring] EGPRS Mode Screen Input Field 5-111
Table 5-47. [Manual Test] EGPRS Mode Attached Screen Mobile Phone Information 5-112
Table 5-48. [Manual Test] EGPRS Mode Peak TX Power/ Burst Timing/Power Ramp Screen Input Field 5-119
Table 5-49. [Manual Test] EGPRS Mode Peak TX Power/Burst Timing/Power Ramp Screen Field 5-120
Table 5-50. [Manual Test] EGPRS Mode Phase Error/Frequency Error Screen Input Field 5-123
Table 5-51. [Manual Test] EGPRS Mode Phase Error/Frequency Error Screen Field 5-124
Table 5-52. [Manual Test] EGPRS Mode EVM Screen Input Field 5-126
Table 5-53. [Manual Test] EGPRS Mode EVM Screen Field 5-127
Table 5-54. [Manual Test] EGPRS Mode Sensitivity Screen Input Field 5-129
Table 5-55. [Manual Test] EGPRS Mode Sensitivity Screen Field 5-130
Table 5-56. [Manual Test] EGPRS Mode ORFS Screen Input Field 5-132
Table 5-57. [Manual Test] EGPRS Mode ORFS Screen Field 5-133
Table 5-58. [Manual Test] EGPRS Mode Spectrum Monitor Screen Input Field 5-135
Table 5-59. [Manual Test] EGPRS Mode Spectrum Monitor Screen Field 5-136
Table 5-60. [TX Analyzer: Stand-by] Screen Input Field 5-139
Table 5-61. TX Analyzer Measurement Item 5-141
Table 5-62. [TX Analyzer] Peak TX Power/ Burst Timing/ Power Ramp Screen Input Field 5-147
Table 5-63. [TX Analyzer] Peak TX Power/Burst Timing/Power Ramp Screen Field 5-149
Table 5-64. [TX Analyzer] Phase Error/Frequency Error Screen Input Field 5-151
Table 5-65. [TX Analyzer] Phase Error/Frequency Error Screen Field 5-153
Table 5-66. [TX Analyzer] EVM/Frequency Error/OOS Screen Input Field 5-155
Table 5-67. [TX Analyzer] EVM/Frequency Error/OOS Screen Field 5-157
Table 5-68. [TX Analyzer] EGPRS Mode ORFS Screen Input Field 5-159
Table 5-69. [Manual Test] EGPRS Mode ORFS Screen Field 5-160
Table 5-70. [TX Analyzer] Spectrum Monitor (span 0 - 400kHz) Screen Field 5-162
Table 5-71. [TX Analyzer] Spectrum Monitor (span +-100kHz) Screen Field 5-164
Table 5-72. [TX Analyzer] Spectrum Monitor Screen Input Field 5-165
Table 5-73. [Signal Generator] Screen Input Field 5-168

Table 5-74. [Configuration] Screen Input Field 5-170
Table 5-75. Setting Combination for Automatic Test Flow 5-174
Table 5-76. [Configuration: Test Sequence] Screen Input Field 5-174
Table 5-77. Configuration: Test Sequence Measurement Item 5-176
Table 5-78. [Configuration: Test Sequence] Screen Input Field 5-179
Table 5-79. Configuration: Test Condition Measurement Item 5-182

6 Troubleshooting

Table 6-1. Item to be checked 6-2
Table 6-2. The time for measuring 6-6
Table 6-3. Alarm Notification Error Code 6-7
Table 6-4. UI Timer Error Code 6-8

7 Performance and Specifications

Table 7-1. Peak TX Power 7-2
Table 7-2. Power Ramp 7-2
Table 7-3. Frequency Error 7-2
Table 7-4. Phase Error 7-3
Table 7-5. Burst Timing 7-3
Table 7-6. BER, FER / BLER 7-3
Table 7-7. RX Quality 7-4
Table 7-8. RX Level 7-4
Table 7-9. Actual Timing Advance 7-4
Table 7-10. Spectrum Monitor 7-5
Table 7-11. Frequency Offset 7-5
Table 7-12. AM Modulation 7-5
Table 7-13. EVM (8-PSK) 7-5
Table 7-14. Origin Offset suppression 7-6
Table 7-15. Output RF Spectrum 7-6

8 Appendix A Input Fields and Allowable Choices or Ranges

Table 8-1. Input Fields and Allowable Choices or Ranges 8-2

9 Appendix B General Information in the GSM System

Table 9-1. RF Channels 9-2
Table 9-2. Power Classes 9-2
Table 9-3. Power Control Levels 9-3
Table 9-4. RX Level 9-4
Table 9-5. RX Quality 9-5
Table 9-6. Limits for BER and FER 9-5

1
Legal Information

Warranty 1-2
Technology Licenses 1-2
Restricted Rights Legend 1-2
Service And Support 1-3
Agilent On The Web 1-3
Agilent By Phone 1-3

Legal Information

Warranty

The material contained in this document is provided “as is,” and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Restricted Rights Legend

If software is for use in the performance of a U.S. Government prime contract or subcontract, Software is delivered and licensed as “Commercial computer software” as defined in DFAR 252.227-7014 (June 1995), or as a “commercial item” as defined in FAR 2.101(a) or as “Restricted computer software” as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause. Use, duplication or disclosure of Software is subject to Agilent Technologies’ standard commercial license terms, and non-DOD Departments and Agencies of the U.S. Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2)(June 1987). U.S. Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2)(November 1995), as applicable in any technical data.

Service And Support

Any adjustment, maintenance, or repair of this product must be performed by qualified personnel. Contact your customer engineer through your local Agilent Technologies Service Center.

Agilent On The Web

You can find information about technical and professional services, product support, and equipment repair and service on the Web: **http://www.agilent.com/**

Double-click the link to **Test & Measurement**. Select your country from the drop-down menus. The Web page that appears next has contact information specific for your country

Agilent By Phone

If you do not have access to the Internet, call one of the numbers in **Table 1-1**.

Table 1-1 Agilent Call Centers and Regional Headquarters

United States and Canada:	Test and Measurement Call Center (800) 452 4844 (toll-free in US)
Europe:	(41 22) 780 8111
Japan:	Measurement Assistance Center (81) 0426 56 7832
Latin America:	305 269 7548
Asia-Pacific:	(85 22) 599 7777

Manufacturing Address

Agilent Technologies Microwave Products (Malaysia) Sdn. Bhd.

Bayan Lepas Free Industrial Zone,

11900 Penang,

Malaysia.

THIS PAGE IS INTENTIONALLY LEFT BLANK

2
Caution and Safety Requirements

Safety Summary 2-2
Safety Notices 2-2
Warning Label 2-2
General 2-3
When Operating The Tester 2-3

Safety Information

Safety Summary

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies, Inc. assumes no liability for the customer's failure to comply with these requirements.

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like, that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Warning Label

A warning label is stuck on the front panel of the Tester.

Do not remove, damage or modify the warning label.

General

WARNING **The protection provided by the N9360A system may be impaired if the tester is used in a manner not specified by Agilent or the instructions on the display are not followed.**

WARNING **DO NOT INSTRUMENT COVERS. Operating personnel must not remove any instrument covers. Component replacement and internal adjustments must be made only by qualified service personnel. Products that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by a qualified service personnel.**

When Operating The Tester

CAUTION Make sure that the input signal level does not exceed the maximum level allowed. Tester failure may result otherwise.

CAUTION Do not turn off the Line switch on the rear panel of the Tester while the LINE LED on the front panel of the Tester is lit in green. Otherwise, Tester failure may occur.

THIS PAGE IS INTENTIONALLY LEFT BLANK

3 Overview

Functions 3-2
Features 3-4
Standard Configuration 3-5
Accessories 3-6

This chapter concisely describes the N9360A GSM Option, though it does not describe every operating feature in detail. It provides an overview to quickly understand the essential components of the GSM Option.

GSM Option is a software for *N9360A Multi UE Tester* which supports the signaling tests and the RF performance tests in inspection processes for production, service, repair and maintenance.

This product supports the GSM850 band while the GSM900, DCS1800, and PCS1900 bands are supported by the conventional Tester. Also, this product newly implements various functions such as GPRS (General Packet Radio Service) (CS1, CS2, CS3 and CS4) and SMS (Short Message Service) and offers major tests with high speed and ease.

This product can carry out the radio performance tests with call processes. In addition, this product implements TX Analyzer function to execute RF radio performance tests without call processes and Signal Generator function used to adjust the radio parts.

Functions

Table 3-1 shows the functions of this Tester in the GSM Option.

Table 3-1 Main Functions

Function	Description	
GSM/GPRS/EGPRS (Option)	Multi band: GSM850, GSM900, DCS1800, PCS1900	
	Signaling Test	
	GSM	
		Location update
		MS Call
		Talk
		RF Test MS Release
		BS Call
		BS Release
	GPRS	

Table 3-1 Main Functions

Function	Description	
		Attach Connect Disconnect Coding scheme: CS1, CS2, CS3, CS4
		Multi slot: 1×1, 2×1, 2×2, 3×1, 3×2, 4×1 (Down×Up)
	EGPRS	
		Attach Connect Disconnect Modulation and Coding scheme: MCS1, MCS2, MCS3, MCS4 (GMSK) MCS5, MCS6, MCS7, MCS8, MCS9 (8-PSK) Puncturing scheme: P1, P2, P3 * Multi slot: 1×1, 2×1, 2×2, 3×1, 3×2, 4×1
	SMS	
		SMS CB, SMS MT, SMS MO
	RF Tests	
		Peak TX Power
		Burst Timing
		Power Ramp
		Frequency Error
		Phase Error (RMS) (Peak) (GMSK)
		BER (GSM, GPRS)
		BLER (GPRS, EGPRS)
		RX Quality
		RX Level FAST BER (GSM) EVM (RMS, PEAK, 95%) (EGPRS, 8-PSK) Origin Offset Suppression (EGPRS)
	TX Analyzer	
	Signal Generator	
	AM Modulation	
	Frequency Offset	

Table 3-1 Main Functions

Function	Description
Remote Control	Ethernet GP-IB (option) Serial (option)

* P1, P2 is valid for all. P3 is valid only when the Coding Scheme is set to MCS3, MCS4, MCS7, MCS8, and MCS9.

Features

Easy-to-operate Automatic Test

The tests from call processes to the radio performance tests are executed automatically with easy operation. Each test item in Automatic Test can be set to either `On` or `Off`. Testing time can be shortened by setting the unnecessary test items to `Off`.

Shortening of Testing Time

In Automatic Test, tests are executed while preset traffic channels are automatically handed over. Consequently, re-testing for each traffic channel is not required and testing time can be shortened.

Various Test Functions

Besides Automatic Test, Manual Test, Signal Generator and Spectrum Monitor, functions such as GPRS (CS1, CS2, CS3 and CS4), EGPRS (Option G03, MCS1-9) and SMS are added to this product. Therefore, this product can meet the needs in every inspection process.

Extensive Interfaces

Ethernet, USB, GP-IB and Serial port are prepared. The USB ports are used to connect a printer or a USB memory device for firmware update or saving and restoring parameters. Ethernet, GP-IB, and Serial are used for remote control.

External Control Function (Remote Control)

Remote control is available using Ethernet, GP-IB or Serial. Each interface port uses the same commands.

An interface port which adapts to user's equipment is selectable.

Standard Configuration

Table 3-2 shows the standard configuration of the Tester. Check the components before using the Tester.

Table 3-2 Configuration

Item name	Type	Quantity	Remarks
GSM Standard	G00 Preinstalled	1	Installed on the Tester
User Manual	N9360A-90700	1	Contained in the CD-R
Programming Manual	N9360A-90702	1	
Quick Reference	N9360A-90002	1	
Installation Guide	N9360A-90001	1	
Antenna coupler	CAU-17	1	Frequency Range: 824 to 1990 MHz Coupling Factor: 15 dB (at 824 to 960 MHz)
Certificate of Calibration	—	1	
GP-IB Port	E00	IEEE, 24 pin Connector (Amphenol)	GP-IB Port
Serial Port	E01	D-sub 9 pin male Connector	Serial Port
EGPRS Option	G03	EGPRS function	EGPRS Option

Accessories

Table 3-3 shows the accessories of the Tester. For the specification of the accessories, contact the Agilent Sales Department or an approved distributor.

Table 3-3 Accessories

Item Name	Type	Remarks
Test SIM card	—	Test Subscriber Identity Module card

4
Operating Procedures

Test Flow 4-2
Preparation for Each Test 4-3
Connection 4-4
Test Procedure 4-5
Ending a Test 4-87

This chapter describes how to operate the Tester including the fundamental requirements before starting the tests with the Tester. It also provides testing examples.

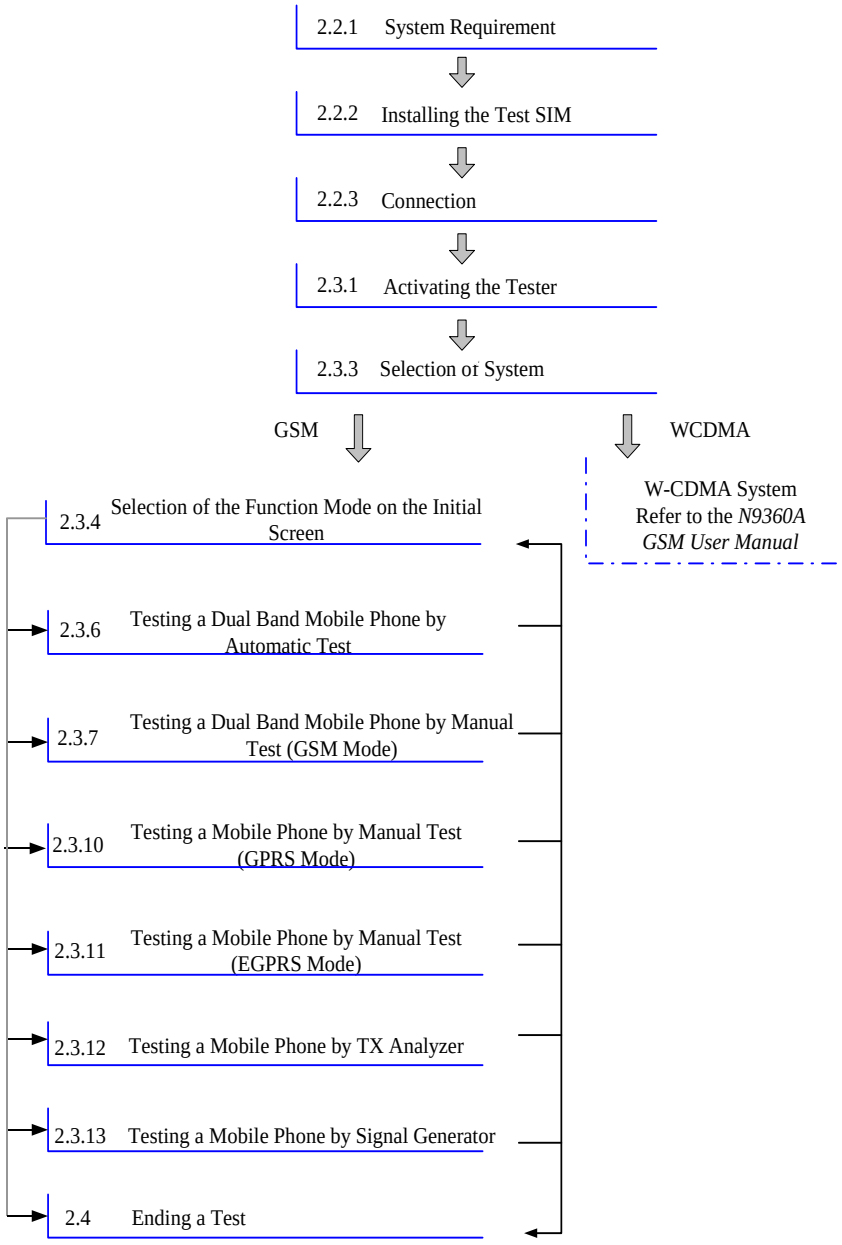
Test Flow

This section describes a test flow to check the mobile phone with the N9360A GSM Option and GPRS Option.

Figure 4-1 shows the test operation flow.

Subsequently, the mobile phone operation method is described according to the test flow.

Figure 4-1 Test Flow


2.2.1 System Requirement
2.2.2 Installing the Test SIM
2.2.3 Connection
2.3.1 Activating the Tester
2.3.3 Selection or System
GSM
WCDMA
W-CDMA System
Refer to the N9360A
GSM User Manual
2.3.4 Selection of the Function Mode on the Initial Screen
2.3.6 Testing a Dual Band Mobile Phone by Automatic Test
2.3.7 Testing a Dual Band Mobile Phone by Manual Test (GSM Mode)
2.3.10 Testing a Mobile Phone by Manual Test (GPRS Mode)
2.3.11 Testing a Mobile Phone by Manual Test (EGPRS Mode)
2.3.12 Testing a Mobile Phone by TX Analyzer
2.3.13 Testing a Mobile Phone by Signal Generator
2.4 Ending a Test

Preparation for Each Test

CAUTION Make sure that the input signal level does not exceed the maximum level allowed. Otherwise, an accident or Tester failure may occur.

The following procedures are required before starting each test.

System Requirement

The following equipments are required to set up a test system:

- The Agilent N9360A Multi UE Tester.
- An RF cable, RF antenna coupler (type CAU-17) or shield case (part number 0960-2540) to connect RF signals from/to the mobile phone under test.
- A printer and a printer cable if required.

Figure 4-2 Typical Test Setup of the Tester

Installing the Test SIM

Insert the Test Subscriber Identity Module (SIM) provided by the Agilent Technologies in the mobile phone before performing any test because the Tester will not be able to perform measurements with a SIM that is provided by the cell phone operator or other Test SIMs.

Connection

Connecting a Mobile Phone

Connect a mobile phone to the Tester using any of the following methods:

1 Using the Antenna Coupler

Connect the Antenna Coupler (type CAU-17) connector to the RF IN/OUT connector on the front panel of the Tester. Insert the antenna of the mobile phone into the hole of the Antenna Coupler.

2 Using a User-Supplied RF Cable

If you have a cable which connects between the mobile phone's RF port and the RF IN/OUT connector of the Tester, use it instead of the Antenna Coupler.

3 Using the Shield Case

Connect the ANTENNA COUPLER IN/OUT connector of the shield case (part number 0960-2540) to the RF IN/OUT connector on the front panel of the Tester. Place the mobile phone on the antenna coupler board inside the shield case using the horizontal and vertical holders.

Connecting a Printer / USB Memory Device

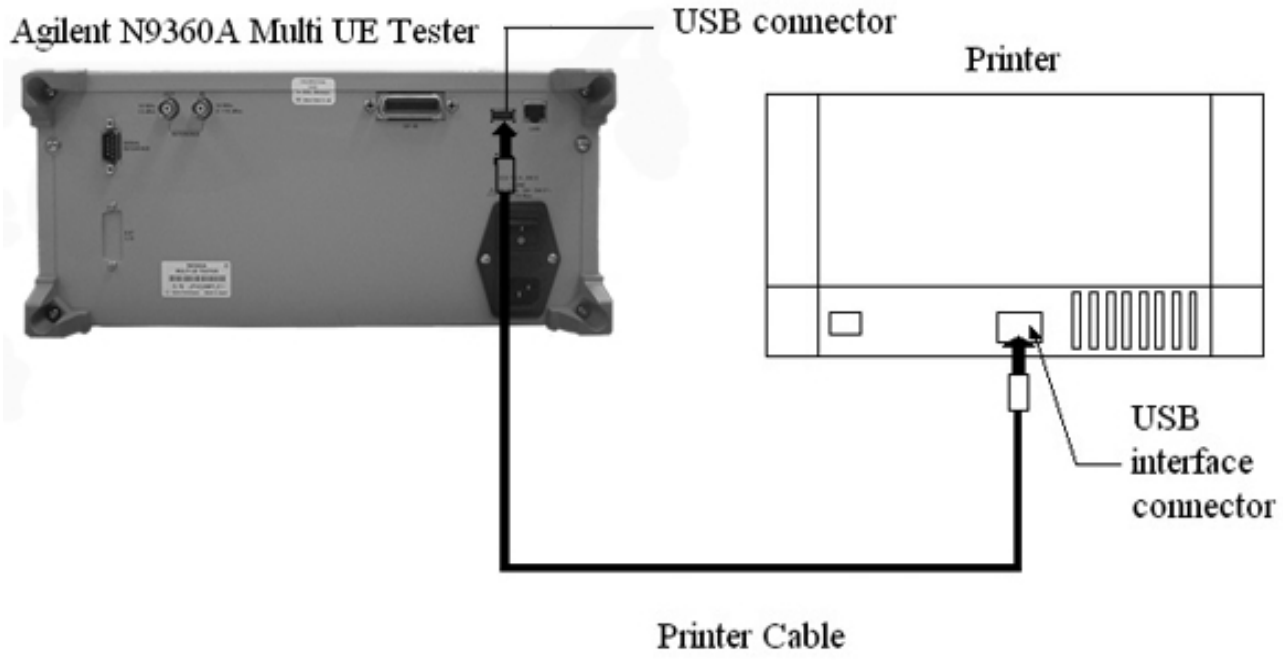
1 Printer

To print screen hardcopies, if required, connect a printer to the Tester as follows using an appropriate interface cable between the USB connector on the rear panel of the Tester and the USB interface connector of the printer. Use the recommended printer shown below. Also, refer to the manual of the printer for operating the printer.

Recommended printer (operation confirmed by Agilent):

EPSON PM-G800

Figure 4-3 Connecting a Printer



2 USB Memory Device

To save graphic files of screen in a USB memory device, connect the USB memory device to the USB connector on the front panel of the Tester. Graphic files are saved in Portable Network Graphics (PNG) format and with a file name: COPY and the number from 00 to 99 which automatically increases.

Test Procedure

Activating the Tester

To activate the Tester, turn on the Line switch on the rear panel of the Tester and press the LINE switch on the front panel.

NOTE Provide warm up of 30 minutes or more to ensure correct measurement.

General Operation

Display Annotation

Depending on functions and test situations, there are several types of screen. Figure 4-4 shows the common areas on the typical screen.

Figure 4-4 Display Annotation

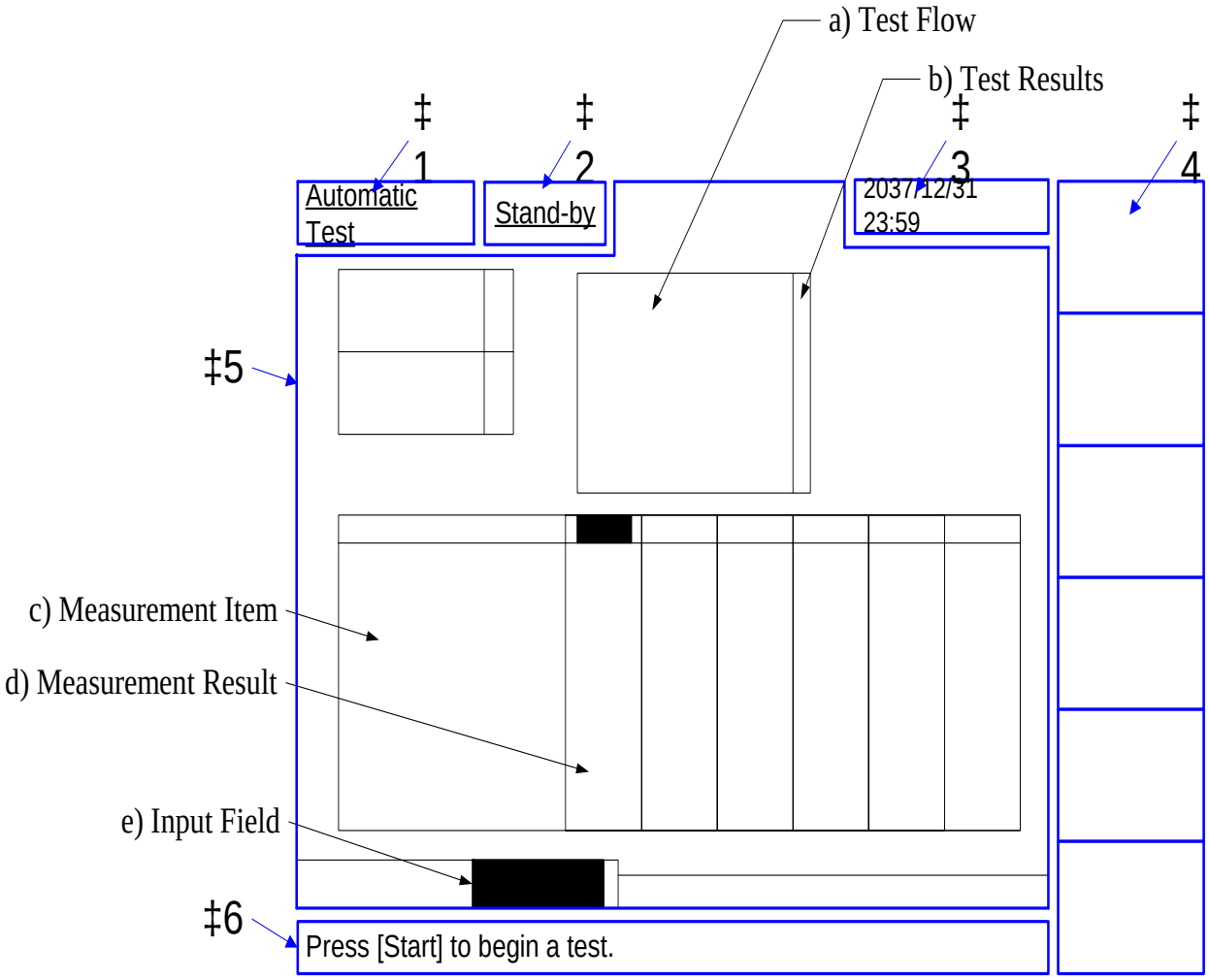


Table 4-1 Description of the Display Annotation

No.	Name	Description
1	Function Mode Field	The current function mode is displayed in this field.
2	Status Display Field	The current operation status in the Automatic Test, Manual Test, TX Analyzer and Configuration are displayed in this field. This status includes Stand-by, Measuring, Test Condition and Test Sequence.
3	Date/Time Field	The current date and time are displayed in this field.

Table 4-1 Description of the Display Annotation

No.	Name	Description
4	Softkey Menu Field	The softkey labels are displayed in this field. Each label defines the function of the corresponding softkey immediately next to the right of the label.
5	Screen Field	A variety of information is displayed in this field depending on the operation status. For example, in Automatic Test, the following information is displayed in this field. a) Test Flow: Location Update, MS Call, BS Call, etc. b) Test results: P (pass) or F (fail). c) Measurement Items: Peak TX Power, Frequency Error, etc. d) Measurement Results: Pass/Fail or values. e) Input field: Highlighted fields.
6	Message Field	Operation message for test flow steps are displayed in this field. In this field, the word surrounded by bracket denotes the softkey.

Test Parameters, Test Items and Allowable Ranges

Depending on the function modes, the Tester has a number of input fields to be specified or defined to configure a test flow, test sequence and test condition. The allowable ranges for those input fields depending on the radio systems are explained in this manual. For a quick overview, refer to Appendix A Input Fields and Allowable Choices or Ranges on page 1.

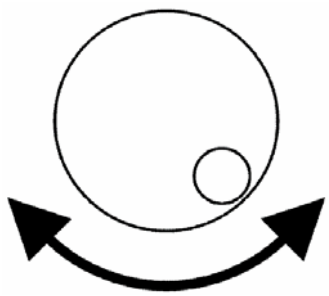
Selecting an Input Field and Specifying a Value

All input fields to be specified are highlighted and the circular cursor is shown next to one of them.

To start, first select an input field and then specify a value to the input field by the following procedure:

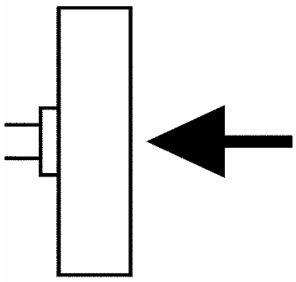
Step 1

Rotate the CURSOR CONTROL knob clockwise to move the cursor downward or right, or rotate it counterclockwise to move it upward or left, and place it next to the input field you want to change.



Step 2

Press the CURSOR CONTROL knob once. The highlighted input field changes to normal display and circular cursor changes to a triangular one.



Step 3

Rotate the CURSOR CONTROL knob clockwise or counterclockwise to find the values defined for it.

Step 4

Press the CURSOR CONTROL knob to enter the desired value in the input field. The input field is highlighted again and the triangular cursor returns to the circular one.

Storing Numeric Values

For numeric input fields such as channel numbers and relevancies of amplitude, you can store up to four numeric values into the memory softkey menus with the following procedure:

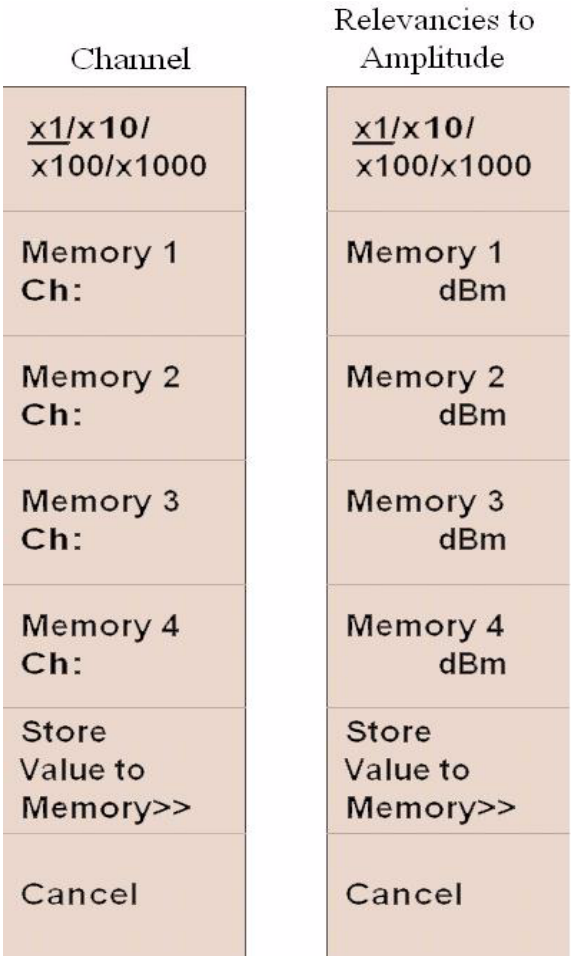
Step 1

Move the cursor to one of the numeric input fields of channels and relevancies of amplitude.

Step 2

Press the CURSOR CONTROL knob to select the field. The softkey menu as Figure 4-5 is displayed on the screen. The four memory softkeys show the values previously stored in the memories if any.

Figure 4-5 Value Storage Softkeys



Step 3

Set a numeric value in the input field with the CURSOR CONTROL knob.

Step 4

Press the **Store Value to Memory >>** softkey. The softkey menu including **Memory 1**, **Memory 2**, **Memory 3** and **Memory 4** softkeys as shown in Figure 4-6.

Figure 4-6 Memory Function

Step 5

Press either of the memory softkeys from 1 to 4 where you desire to store that value.

Step 6

The memory softkey menu returns to the state in Step 2 showing the value newly stored.

Step 7

Press the CURSOR CONTROL knob to set the value into the field. The softkey menu returns to that of Step 1.

Step 8

Repeat the procedure from Step 1 to Step 7, if required.

Recalling Numeric Values

Step 1

Move the cursor to one of the numeric input fields of channels or relevancies of amplitude.

Step 2

Press the CURSOR CONTROL knob to select the field. The softkey menu displayed as shown in Figure 4-7. The four memory softkeys show the values previously stored in the memories if any.

Figure 4-7 Value Storage Softkeys

Step 3

Press **Memory 1**, **Memory 2**, **Memory 3** or **Memory 4** softkey to enter the stored value to the field.

Step 4

The value is entered to the field.

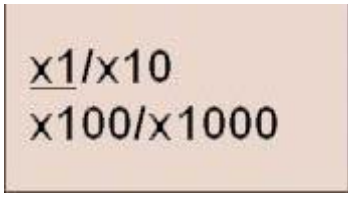
Step 5

Press the CURSOR CONTROL knob to return the softkey menu to that of Step 1.

Changing Magnification Softkey

Press the CURSOR CONTROL knob to select a numeric input field, such as channels and relevancies of amplitude. A changing magnification softkey as in Figure 4-8 is displayed with memory softkeys. A selected magnification is underlined.

Figure 4-8 Changing Magnification Softkey



Pressing this softkey changes the multiplier from 1 to 1000.

Rotating the CURSOR CONTROL knob clockwise changes the numeric value in the field by an increment, and counterclockwise changes the value by a decrement. The following multiplies are variable.

- ×1: Increment or decrement by 1.
- ×10: Increment or decrement by 10.
- ×100: Increment or decrement by 100.
- ×1000: Increment or decrement by 1000.

Selection of System

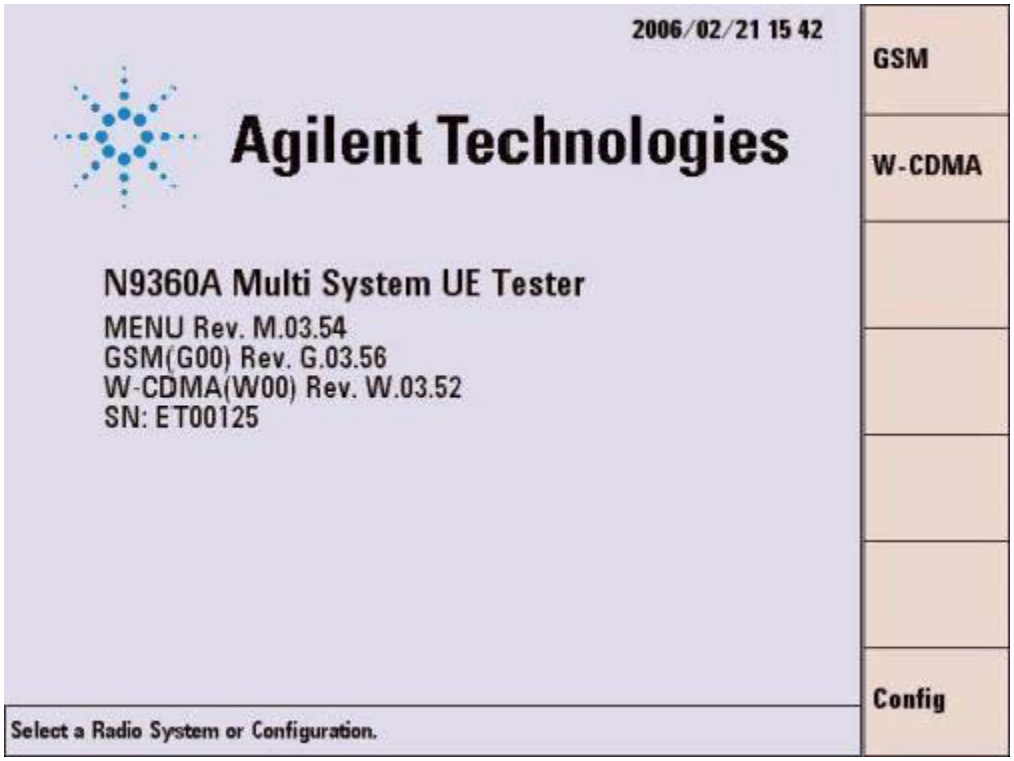
On this screen, select a system from GSM and W-CDMA.

NOTE

This *N9360A GSM User Manual* describes only the GSM system. Refer to the *N9360A W-CDMA User Manual* about the W-CDMA system.

Turn on the Tester. The [Top Menu] screen is displayed as Figure 4-9.

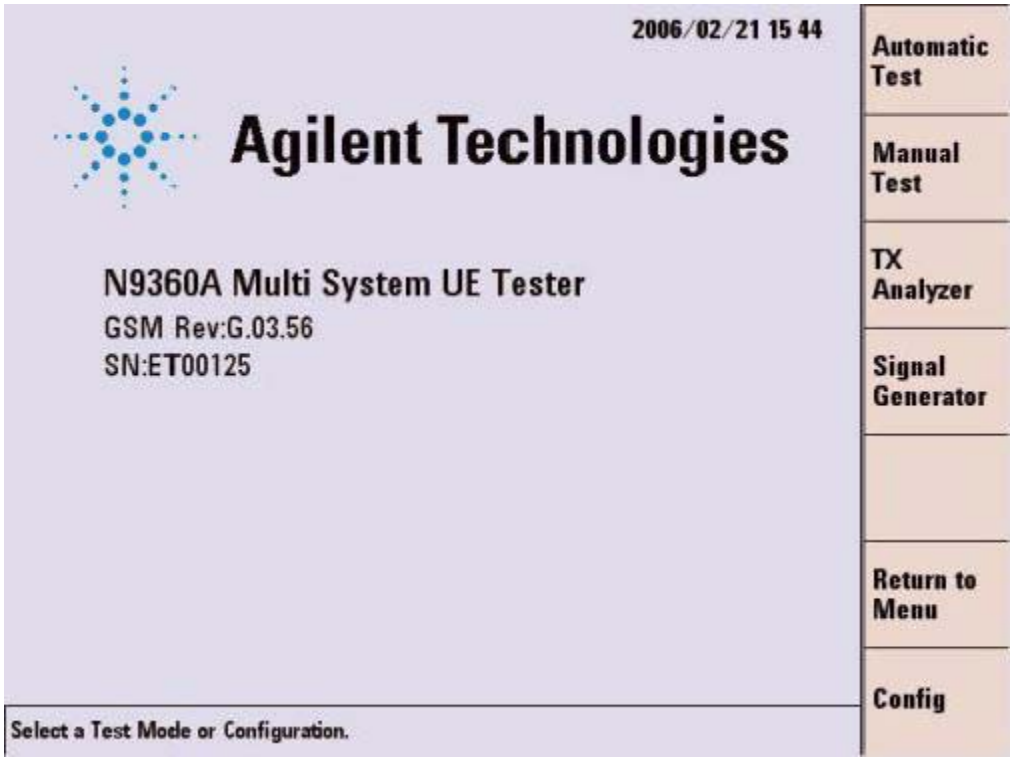
Figure 4-9 [Top Menu] Screen



Step 1

Press the **GSM** softkey to select the GSM system. The [Initial] screen for GSM is displayed after the Tester completes its initialization and self-test routine.

Figure 4-10 [Initial] Screen



NOTE

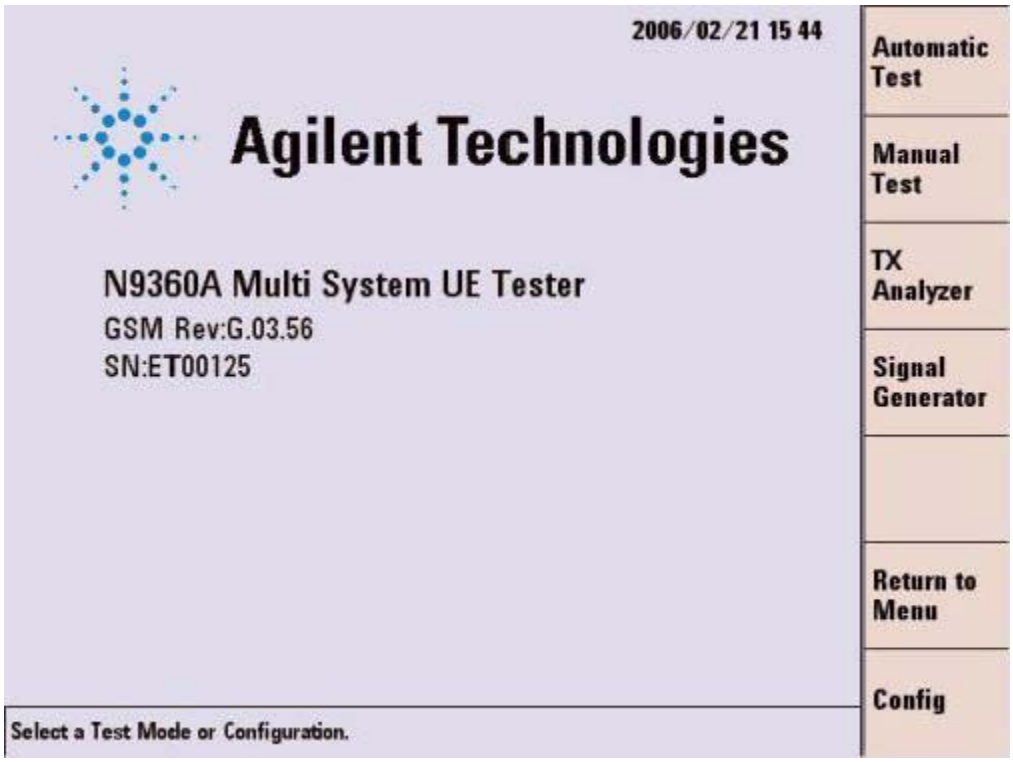
When the Autoboot function is set to `GSM` or `WCDMA` and not to `None`, the Tester will automatically enter the GSM or W-CDMA system mode if no softkey is pressed within the specified time (10 to 60 seconds). When the Tester is shipped, the AutoBoot function is set to `None`. For details, see AutoBoot on page 8.

Selection of the Function Mode on the Initial Screen

The Tester executes its initialization and self-test routine after completion of system setting. The [Initial] screen is displayed subsequently.

Press one of the softkeys to select a function mode.

Figure 4-11 [Initial] Screen



Softkey Menu Field

Softkey menu

Automatic Test: Starts the Automatic Test. Refer to Testing a Dual Band Mobile Phone by Automatic Test on page 22.

Manual Test: Starts the Manual Test. Refer to Testing a Dual Band Mobile Phone by Manual Test (GSM Mode) on page 31 for GSM mode, and Testing a Mobile Phone by Manual Test (GPRS Mode) on page 55 for GPRS mode.

TX Analyzer: Starts the TX Analyzer test. Refer to Testing a Mobile Phone by TX Analyzer on page 75.

Signal Generator: Starts the Signal Generator. Refer to Testing a Mobile Phone by Signal Generator on page 83.

Return to Menu: This softkey is not for selecting a function mode. The screen returns to the [Top Menu] screen when this softkey is pressed. Refer to Return to Menu Screen on page 15 for detail.

Configuration: Go to the [Configuration] screen to set the parameters. Refer to Configuration on page 168.

Correction

Actual Input/Output Level and Correction

1 Actual Output Level and Correction in Automatic Test (Except RF test), Manual Test, and Signal Generator

Output signal level of the Tester is corrected according to cable loss, coupling loss, and etc. Some of parameters should be set properly.

Actual output level (for downlink signal) at the RF IN/OUT connector in the Automatic Test mode (except RF test), the Manual Test mode and the Signal Generator mode is calculated by the following equation.

$$OutputLevel = BsLevel + LossRFOut$$

Where,

OutputLevel = Actual output level at the RF IN/OUT connector.

BsLevel = Setting value at the **BS Level**, **BER BS Level** and **BLER BS Level** field on the [Configuration: Test Condition] screen or the **Amplitude** field on the [Signal Generator] screen.

LossRfOut = Setting value at the **LOSS/RF Out** field on the [Configuration] screen.

There is a restriction that the **OutputLevel** cannot exceed –20.0 dBm, so at each parameter, the **BsLevel** and the **LossRfOut** must be set to meet this restriction.

2 Actual Input Signal Level and Correction in Automatic Test (Except RF test), Manual Test, and TX Analyzer

Input signal level of the Tester (for uplink signal) is corrected according to cable loss, coupling loss, and etc. Some of parameters should be set properly.

The measurement results of RF test in the Manual Test mode and the TX Analyzer mode are corrected by the following equation.

$$InputLevel = MsLevel + LossRFIn$$

Where,

InputLevel = Corrected measured value of the Tester.

MsLevel = Input signal level of the mobile phone at the **RF IN/OUT** connector.

LossRfIn = Setting value at the **LOSS/RF In** field on the [Configuration] screen.

3 Actual Output Level and Correction for RF Test in Automatic Test

Output signal level of the Tester is corrected according to cable loss, coupling loss, and etc. Some of parameters should be set properly.

Actual output level (for downlink signal) at the **RF IN/OUT** connector for RF test in the Automatic Test mode is calculated by the following equation.

$$OutputLevel = BsLevel + LossRFOut + AttOut$$

Where,

OutputLevel = Actual output level at the **RF IN/OUT** connector.

BsLevel = Setting value at the **BS Level**, **BER BS Level** and **BLER BS Level** field on the [Configuration: Test Condition] screen.

LossRfOut = Setting value at the **LOSS/RF Out** field on the [Configuration] screen.

AttOut = Setting value at the **ATT Out** field on the [Configuration: Test Sequence] screen.

There are two restrictions. The **OutputLevel** cannot exceed –20.0 dBm, so each parameter, the **BsLevel**, the **LossRfOut** and the **ATT Out**, must be set to meet this restriction. The other restriction is that the sum of the **LossRfOut** and the **ATT Out** must be set more than or equal to 0.

4 Actual Input Signal Level and Correction for RF Test in Automatic Test

Input signal level of the Tester is corrected according to cable loss, coupling loss, and etc. Some of parameters should be set properly.

The measurement results of RF test in the Automatic Test mode are corrected by the following equation.

$$InputLevel = MsLevel + LossRFIn + AttIn$$

Where,

InputLevel = Corrected measured value of the Tester.

MsLevel = Input signal level of the mobile phone at the **RF IN/OUT** connector.

LossRfIn = Setting value at the **LOSS/RF IN** field on the [Configuration] screen.

AttIn = Setting value at the **ATT In** field on the [Configuration: Test Sequence] screen.

There is a restriction that the sum of the **LossRfIn** and **ATT** In must be set more than or equal to 0.

Entering Loss in Configuration

Determine and enter the loss values caused by the antenna coupler, RF cable, or shield case used to connect the mobile phone to the Tester. If the **Loss** is set to `On`, these path loss values are applied to all through the test flow for the radio system being currently tested.

Correction of input/output signal is described in Actual Input/Output Level and Correction on page 17. Also, refer to Entering Channel Attenuations on the Configuration: Test Sequence Screen on page 20 for the correction of RF test in Automatic Test.

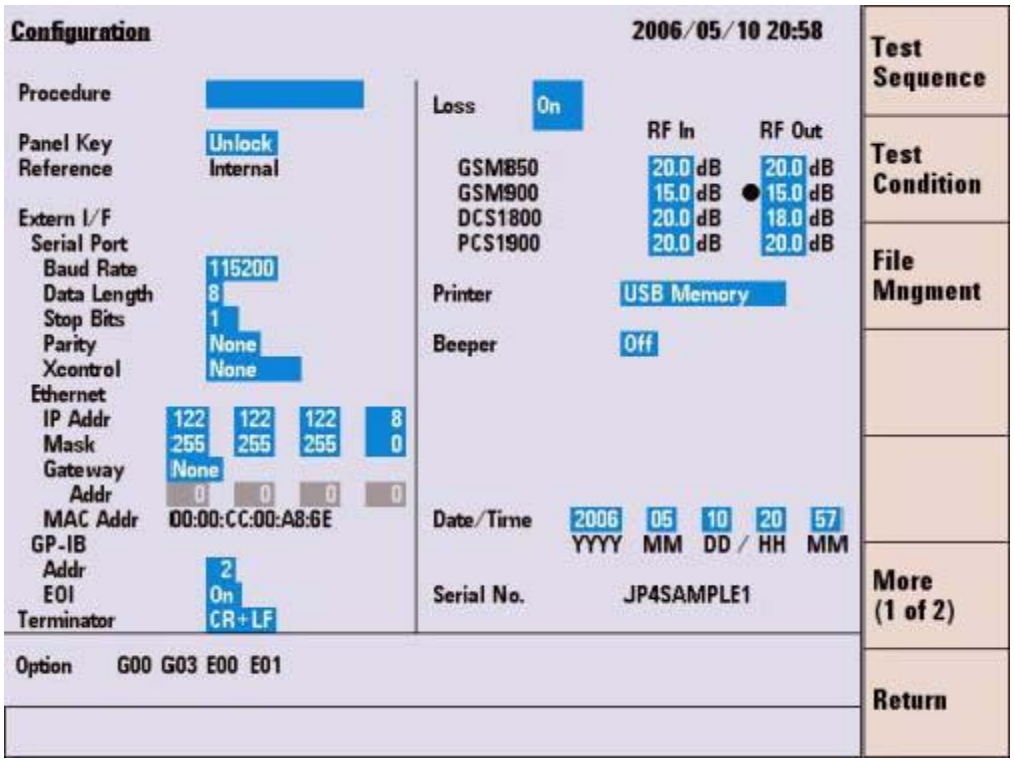
Step 1

Press the **GSM** softkey on the [Top Menu] screen to activate the GSM system. Refer to Selection of System on page 13 for detail.

Step 2

Press the **Config** softkey on the [Initial] screen to display the [Configuration] screen.

Figure 4-12 [Configuration] Screen



Step 3

Set the **Loss** field to `On` with the CURSOR CONTROL knob.

Step 4

Enter the appropriate loss values, depending on the radio systems, in the `RF In` and `RF Out` fields with the CURSOR CONTROL knob. These loss values are used all through the test flow.

Step 5

Press the **Return** softkey to return to the [Initial] screen.

Entering Channel Attenuations on the Configuration: Test Sequence Screen

This section describes correction for RF test results in Automatic Test. Each traffic channel (TCH) path loss can be set on the [Configuration: Test Sequence] screen. This is the RF test correction function in addition to the loss function in the [Configuration] screen.

In addition to entering the loss values on the [Configuration] screen, you can also enter the attenuation values to be used to correct the RF test results with these values at each traffic channel in the Automatic Test mode.

Determine and enter the appropriate attenuation values at each traffic channel with the following procedure, caused by the antenna coupler, RF cable or shield case to connect the mobile phone to the Tester.

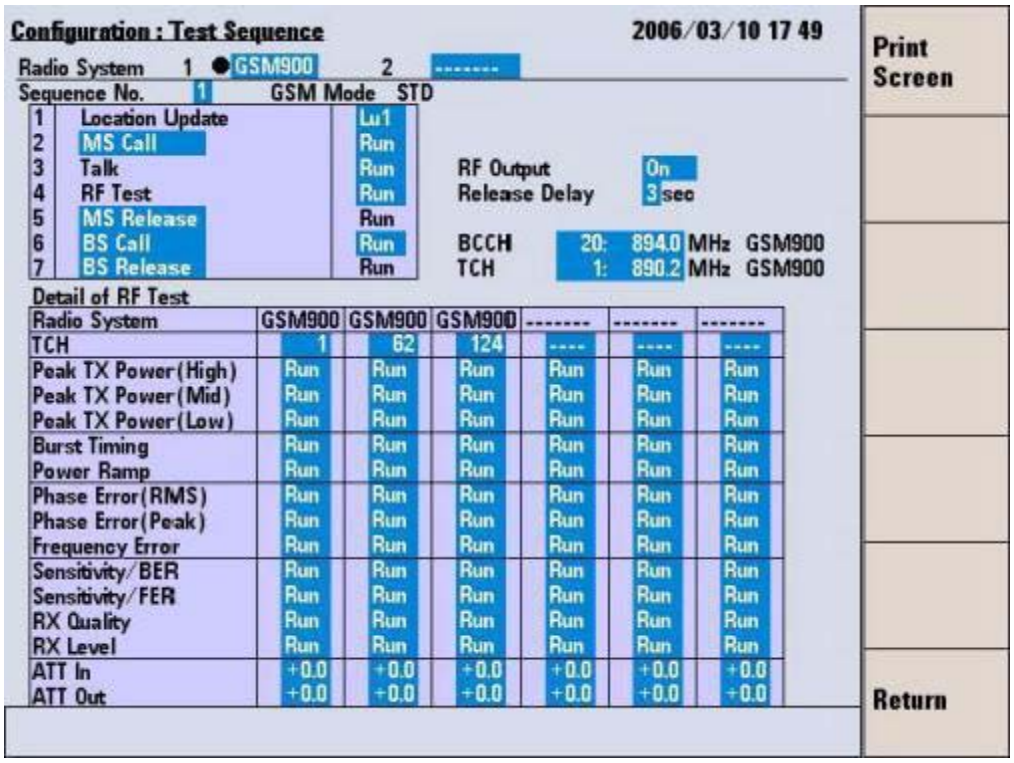
Step 1

Press the **GSM** softkey on the [Top Menu] screen to activate GSM system. Refer to Selection of System on page 13 for detail.

Step 2

Press the **Config** softkey on the [Initial] screen, and then the **Test Sequence** softkey to display the [Configuration: Test Sequence] screen.

Figure 4-13 [Configuration: Test Sequence] Screen


Configuration : Test Sequence
2006/03/10 17 49
Radio System 1 GSM900 2 --------
Sequence No. 1 GSM Mode STD
1 Location Update Lu1
2 MS Call Run
3 Talk Run
4 RF Test Run
5 MS Release Run
6 BS Call Run
7 BS Release Run
RF Output On
Release Delay 3 sec
BCCH 20: 894.0 MHz GSM900
TCH 1: 890.2 MHz GSM900
Detail of RF Test
Radio System GSM900 GSM900 GSM900 -------- -------- --------
TCH 1 62 124 ---- ---- ----
Peak TX Power(High) Run Run Run Run Run Run
Peak TX Power(Mid) Run Run Run Run Run Run
Peak TX Power(Low) Run Run Run Run Run Run
Burst Timing Run Run Run Run Run Run
Power Ramp Run Run Run Run Run Run
Phase Error(RMS) Run Run Run Run Run Run
Phase Error(Peak) Run Run Run Run Run Run
Frequency Error Run Run Run Run Run Run
Sensitivity/BER Run Run Run Run Run Run
Sensitivity/FER Run Run Run Run Run Run
RX Quality Run Run Run Run Run Run
RX Level Run Run Run Run Run Run
ATT In +0.0 +0.0 +0.0 +0.0 +0.0 +0.0
ATT Out +0.0 +0.0 +0.0 +0.0 +0.0 +0.0
Print Screen
Return

Step 3

Enter the appropriate attenuation values, depending on the traffic channel, in the ATT In and ATT Out fields with the CURSOR CONTROL knob. These values are effective for the RF tests in the test flow.

Step 4

Press the **Return** softkey twice to return to the [Initial] screen.

Testing a Dual Band Mobile Phone by Automatic Test

This section describes the operation method of the Tester and a dual band (GSM900 and DCS1800) mobile phone under the test by Automatic Test.

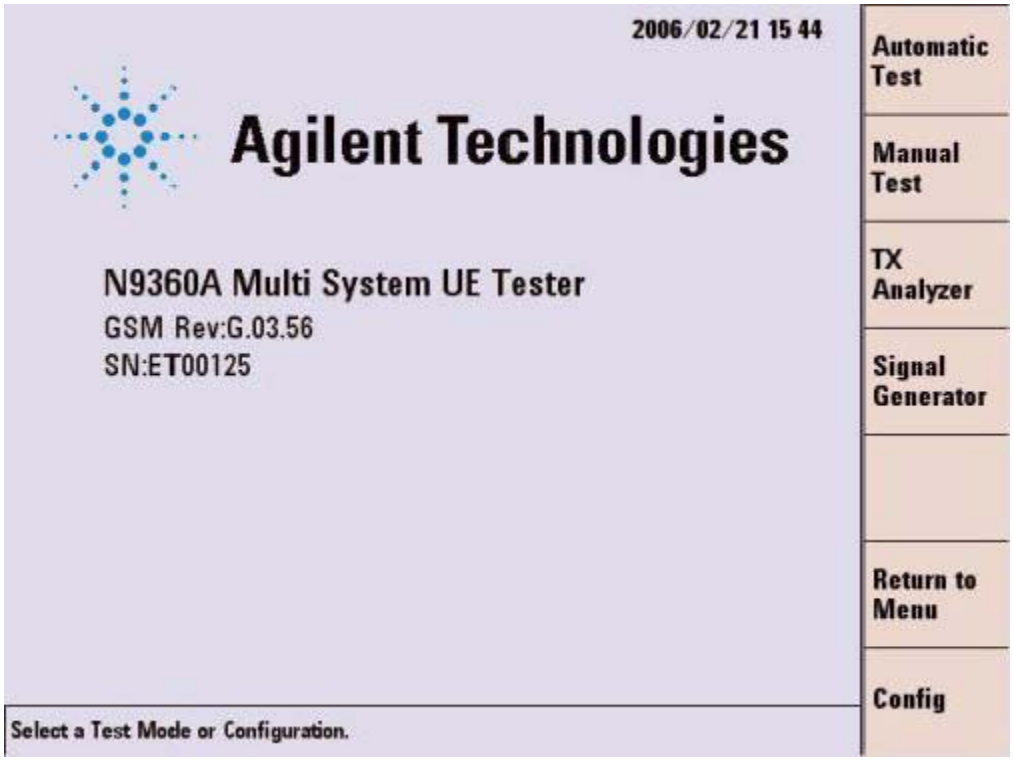
Step 1

Turn on the Tester and select the GSM system on the [Top Menu] screen. Refer to Selection of System on page 13 for selecting a system.

Step 2

The [Initial] screen as Figure 4-14 is displayed after completion of initialization and self-test routine of the Tester.

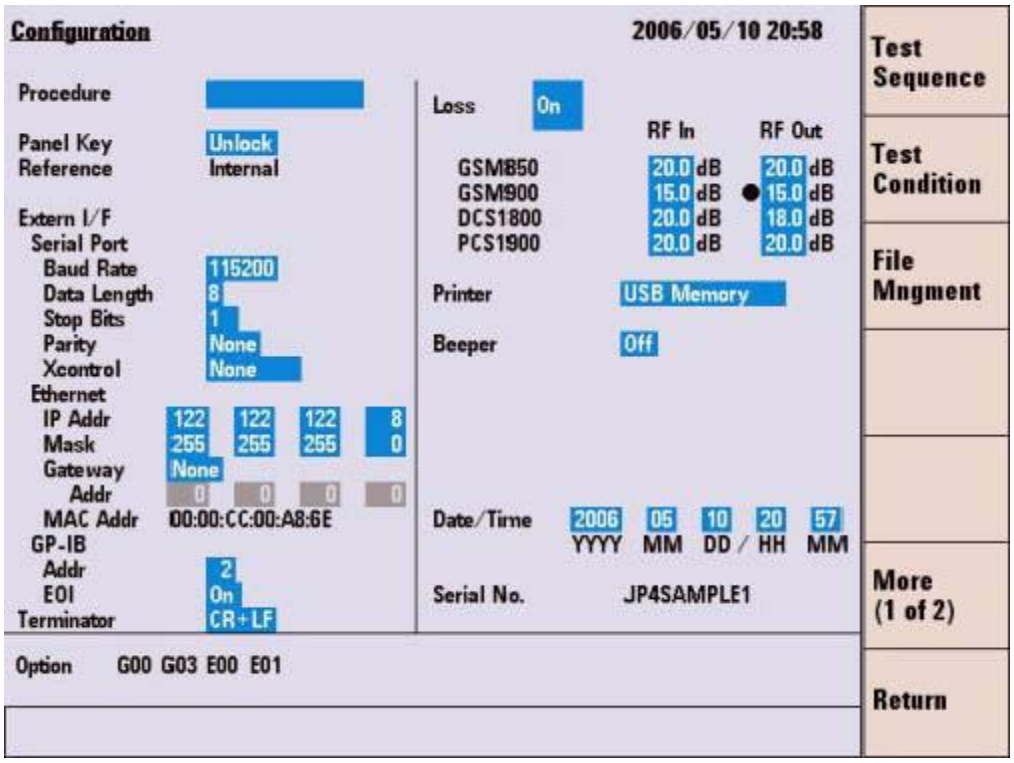
Figure 4-14 [Initial] Screen



Step 3

Press the **Config** softkey on the [Initial] screen to display the [Configuration] screen for specifying the **Loss** field.

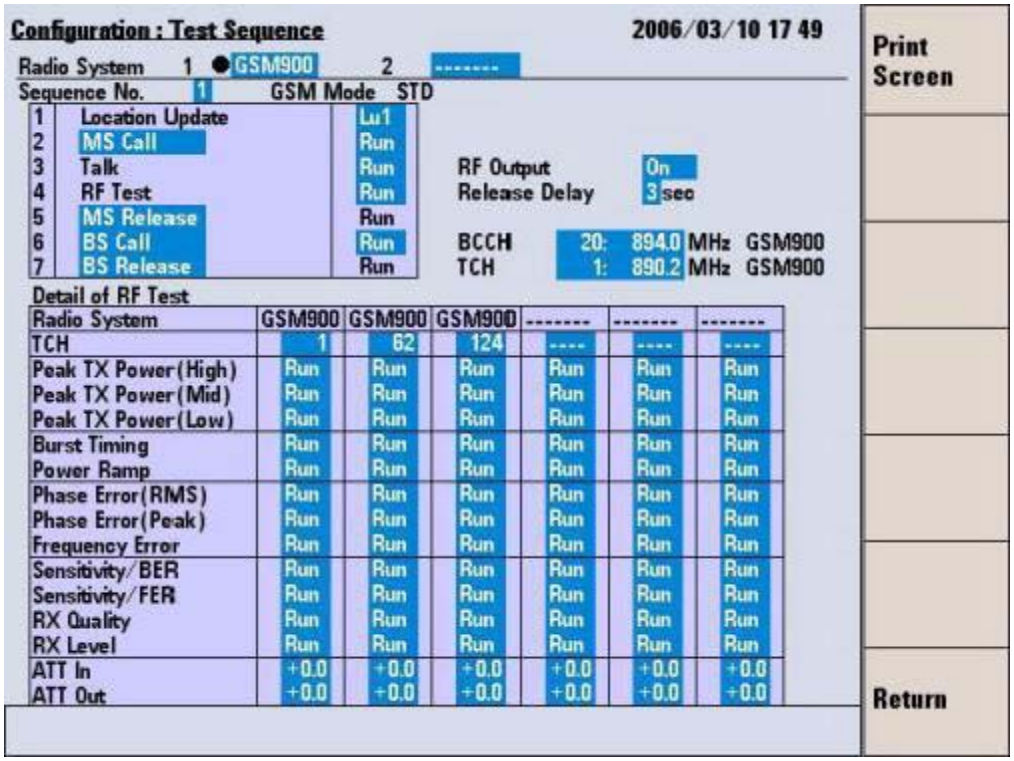
Figure 4-15 [Configuration] Screen



Step 4

Press the **Test Sequence** softkey to display the [Configuration: Test Sequence] screen for required setting in Automatic Test.

Figure 4-16 [Configuration: Test Sequence] Screen


Configuration : Test Sequence
2006/03/10 17 49
Radio System 1 GSM900 2 --------
Sequence No. 1 GSM Mode STD
1 Location Update Lu1
2 MS Call Run
3 Talk Run
4 RF Test Run
5 MS Release Run
6 BS Call Run
7 BS Release Run
RF Output On
Release Delay 3 sec
BCCH 20: 894.0 MHz GSM900
TCH 1: 890.2 MHz GSM900
Detail of RF Test
Radio System GSM900 GSM900 GSM900 -------- -------- --------
TCH 1 62 124 ---- ---- ----
Peak TX Power(High) Run Run Run Run Run Run
Peak TX Power(Mid) Run Run Run Run Run Run
Peak TX Power(Low) Run Run Run Run Run Run
Burst Timing Run Run Run Run Run Run
Power Ramp Run Run Run Run Run Run
Phase Error(RMS) Run Run Run Run Run Run
Phase Error(Peak) Run Run Run Run Run Run
Frequency Error Run Run Run Run Run Run
Sensitivity/BER Run Run Run Run Run Run
Sensitivity/FER Run Run Run Run Run Run
RX Quality Run Run Run Run Run Run
RX Level Run Run Run Run Run Run
ATT In +0.0 +0.0 +0.0 +0.0 +0.0 +0.0
ATT Out +0.0 +0.0 +0.0 +0.0 +0.0 +0.0
Print Screen
Return

Step 5

Set GSM900 and DCS1800 in **Radio System 1** and **2**, respectively, and set other fields as shown in Figure 4-16.

Step 6

Set Run at test item field which you want to execute in the test flow.

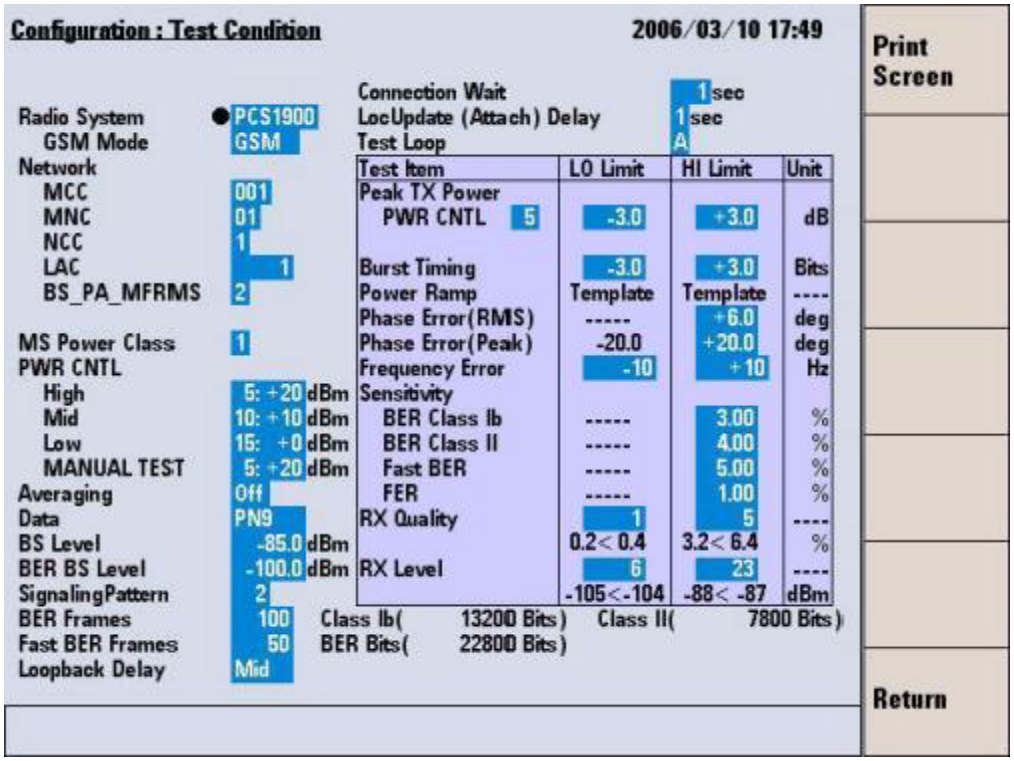
Step 7

Set Run at measurement item cell which you want to measure in the measurement item table.

Step 8

Press the **Return** and then the **Test Condition** softkey to display the [Configuration: Test Condition] screen as Figure 4-17 to set the test condition.

Figure 4-17 [Configuration: Test Condition] Screen


Configuration : Test Condition
2006/03/10 17:49
Print Screen
Return
Connection Wait 1 sec
LocUpdate (Attach) Delay 1 sec
Test Loop A
Radio System PCS1900
GSM Mode GSM
Network
MCC 001
MNC 01
NCC 1
LAC 1
BS_PA_MFRMS 2
MS Power Class 1
PWR CNTL
High 5: +20 dBm
Mid 10: +10 dBm
Low 15: +0 dBm
MANUAL TEST 5: +20 dBm
Averaging Off
Data PN9
BS Level -85.0 dBm
BER BS Level -100.0 dBm
SignalingPattern 2
BER Frames 100
Fast BER Frames 50
Loopback Delay Mid
Test Item | LO Limit | HI Limit | Unit
Peak TX Power
PWR CNTL 5 | -3.0 | +3.0 | dB
Burst Timing | -3.0 | +3.0 | Bits
Power Ramp | Template | Template | ----
Phase Error(RMS) | ----- | +6.0 | deg
Phase Error(Peak) | -20.0 | +20.0 | deg
Frequency Error | -10 | +10 | Hz
Sensitivity
BER Class Ib | ----- | 3.00 | %
BER Class II | ----- | 4.00 | %
Fast BER | ----- | 5.00 | %
FER | ----- | 1.00 | %
RX Quality | 1 | 5 | ----
0.2< 0.4 | 3.2< 6.4 | %
RX Level | 6 | 23 | ----
-105<-104 | -88< -87 | dBm
Class Ib(13200 Bits) Class II(7800 Bits)
BER Bits(22800 Bits)

Step 9

Set the fields of the test parameters as shown in the left side of Figure 4-17 with the CURSOR CONTROL knob.

Step 10

Set appropriate test limits in the cells of the test item table in the right side of Figure 4-17.

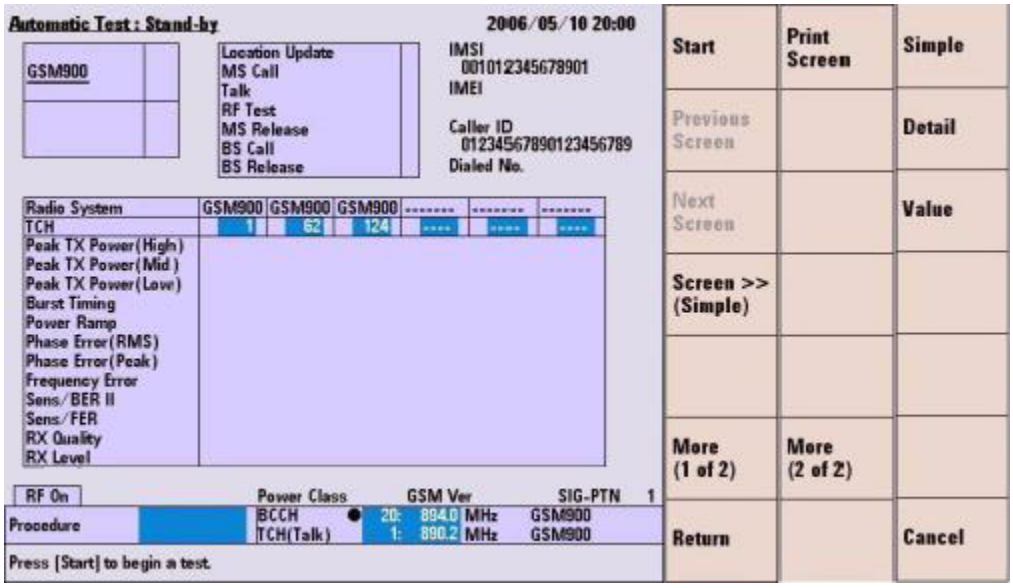
Step 11

Repeat Step 10 to Step 11 to set the test condition for DCS1800 after replacing GSM900 and DCS1800 in **Radio System** field.

Step 12

Press the **Return** softkey twice and then the **Automatic Test** softkey to start Automatic Test. The [Automatic Test: Stand-by] screen as Figure 4-18 is displayed.

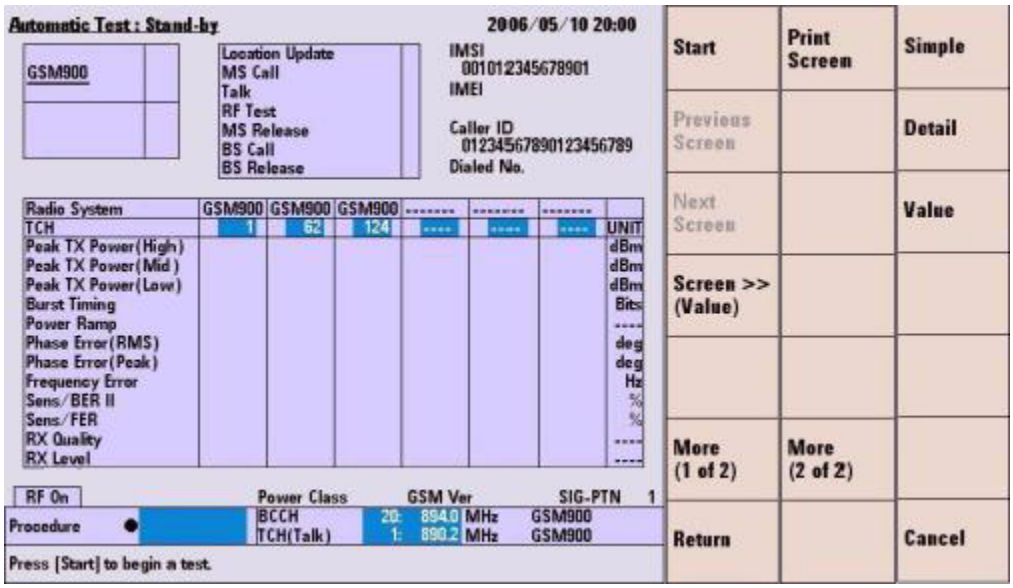
Figure 4-18 [Automatic Test: Stand-by] Screen



Step 13

Press the **Screen>>** softkey to select the display mode. Select **Simple**, **Detail** or **Value** softkey. The following Figure 4-19 is a value screen which will show a measured value for each measurement item.

Figure 4-19 [Automatic Test: Stand-by] Value Screen



Step 14

Press the **Start** softkey to start a test. A screen status changes from Stand-by to Measuring.

Step 15

Turn the mobile phone on. Wait for the mobile phone to camp on, and **P** is shown at the **Location Update** step.

Step 16

At the **MS Call** step, make a call from the mobile phone. Dial an arbitrary number and press the **Off Hook** button on the mobile phone.

Step 17

At the **Talk** step, check the quality of loop back voice and press the **Pass** or the **Fail** softkey according to its result.

Step 18

As each step is running in the test flow, its corresponding test item field in the table is highlighted. While the RF Test step is blinking, each of the measurement items is measured. So, you can see how it is being done.

Step 19

At the **MS Release** step, press the **On Hook** button on the mobile phone to finish the call.

Step 20

At the **BS Call** step, press the **Off Hook** button on the mobile phone to respond to the call from the Tester.

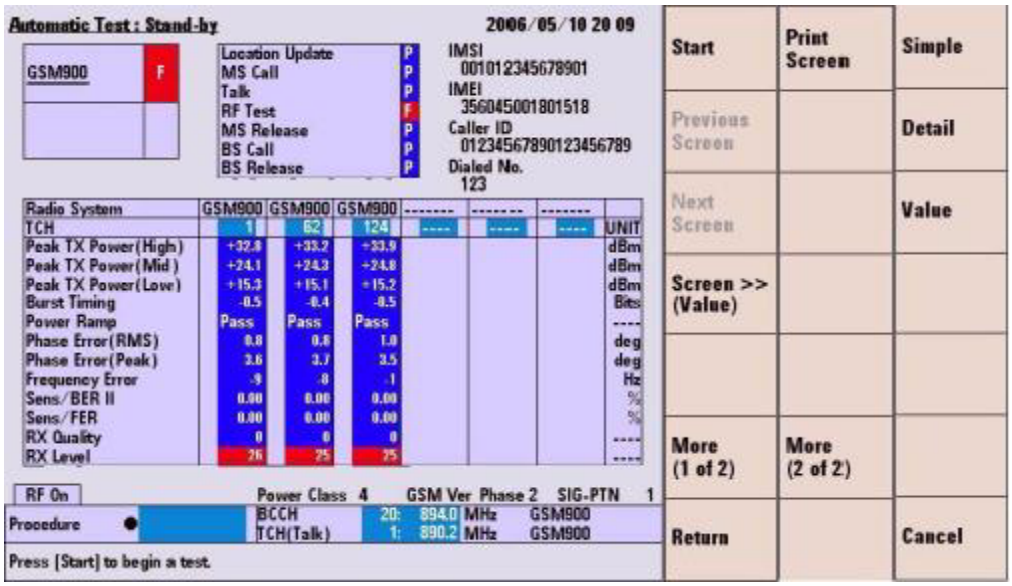
Step 21

If the sequence 2 is set on the [Configuration: Test Sequence] screen, the sequence 2 is executed automatically after the **BS Release** step in the sequence 1 is completed. The test goes on in the same way as sequence 1.

Step 22

After the measurement is completed, a [Stand-by] summary screen is displayed to show the test results.

Figure 4-20 [Stand-by] Summary Screen



Step 23

If a printer is available, print the test results. Press the **More (1 of 2)**, and then the **Print Screen** softkey to print a screen hardcopy.

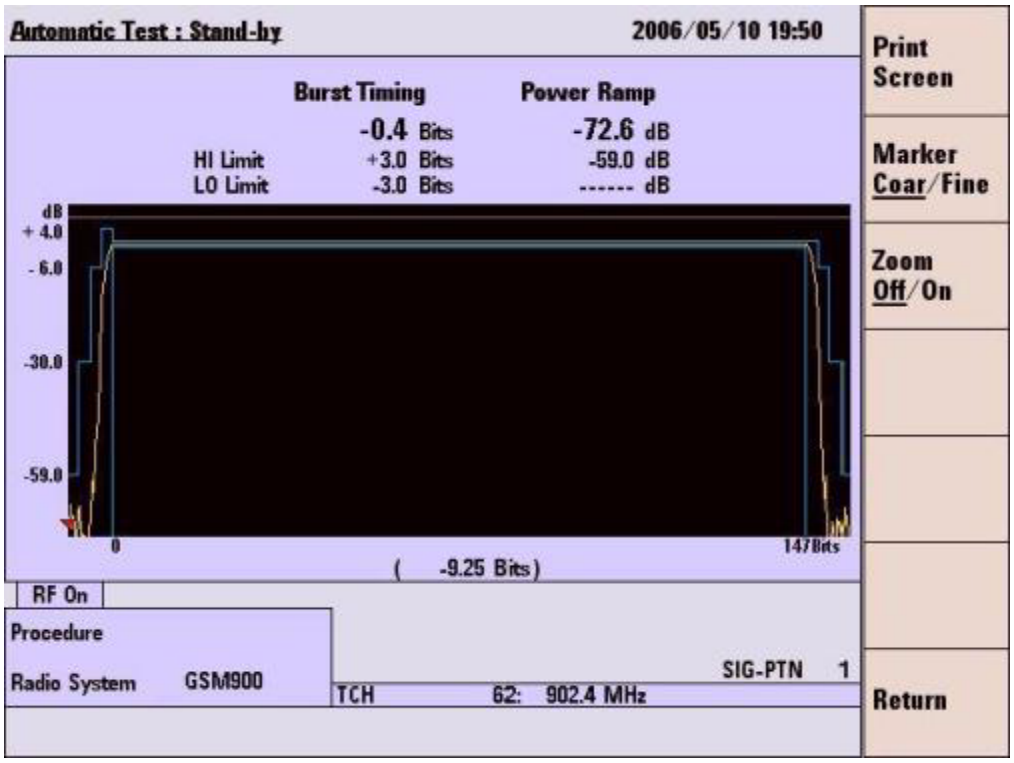
Step 24

Press the **More (2 of 2)** softkey to return to the previous softkey menu.

Step 25

Place the circular cursor at a value, `Pass` or `Fail` of any channel in the **Burst Timing** or **Power Ramp** cell, for example, then press the CURSOR CONTROL knob to display the Graph/Value screen as Figure 4-21. See where the marker appears in the graph, and the failed result data is shown if any (highlighted in this text).

Figure 4-21 [Stand-by] Graph/Value Screen



Step 26

Press the **Return** softkey to return to the previous screen. The Graph/Value screen for other measurement items can be displayed in the same method.

Step 27

If you want to repeat the same test again, press the **Start** softkey.

Testing a Dual Band Mobile Phone by Manual Test (GSM Mode)

This section describes the operation method of the Tester and a dual band (GSM900 and DCS1800) mobile phone under the test by the Manual Test GSM mode.

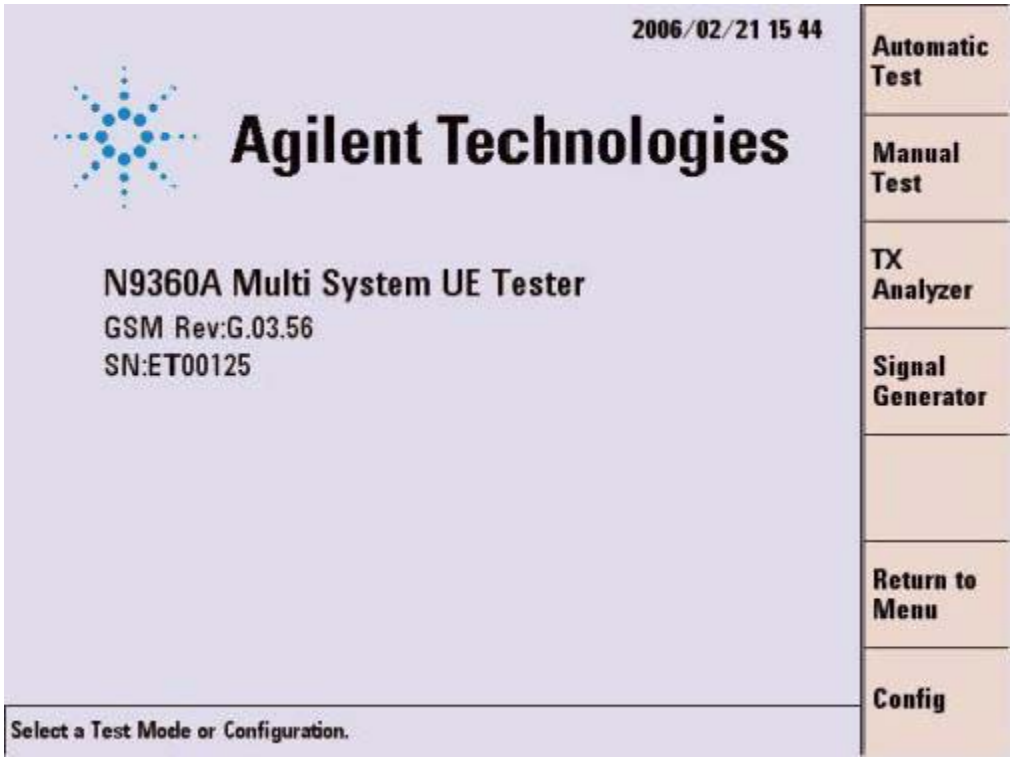
Step 1

Turn on the Tester and select the GSM system on the [Top Menu] screen. Refer to Selection of System on page 13 for selecting a system.

Step 2

The [Initial] screen as Figure 4-22 is displayed after completion of initialization and self-test routine of the Tester.

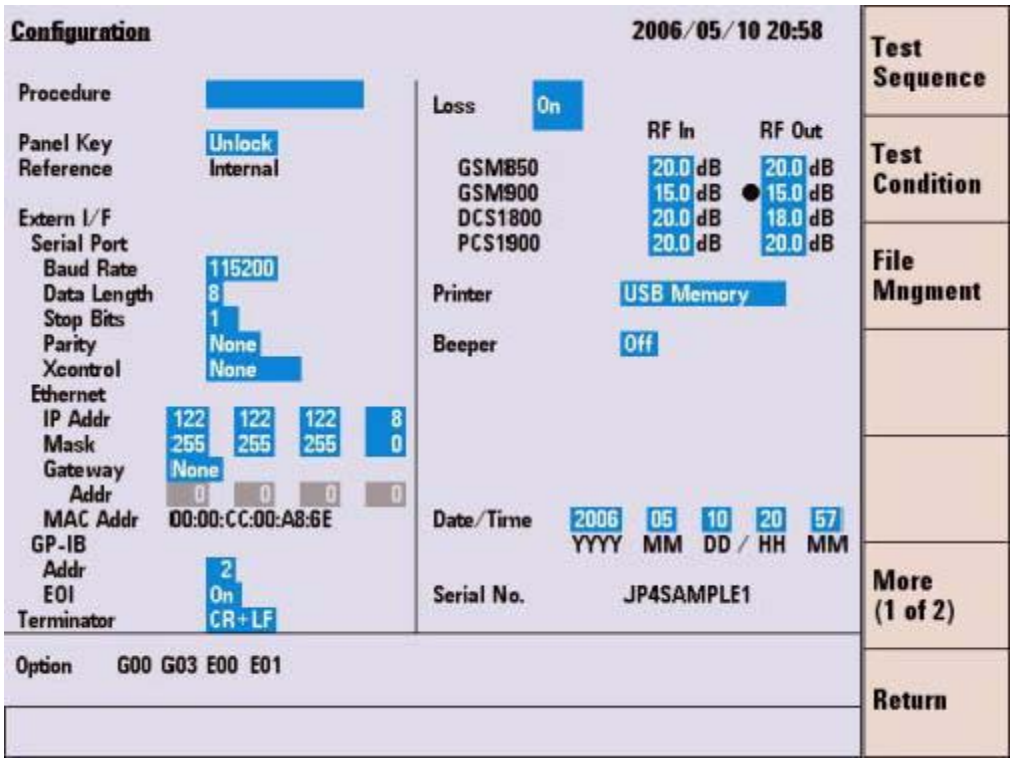
Figure 4-22 [Initial] Screen



Step 3

Press the **Config** softkey on the [Initial] screen to display the [Configuration] screen for specifying the **Loss** field.

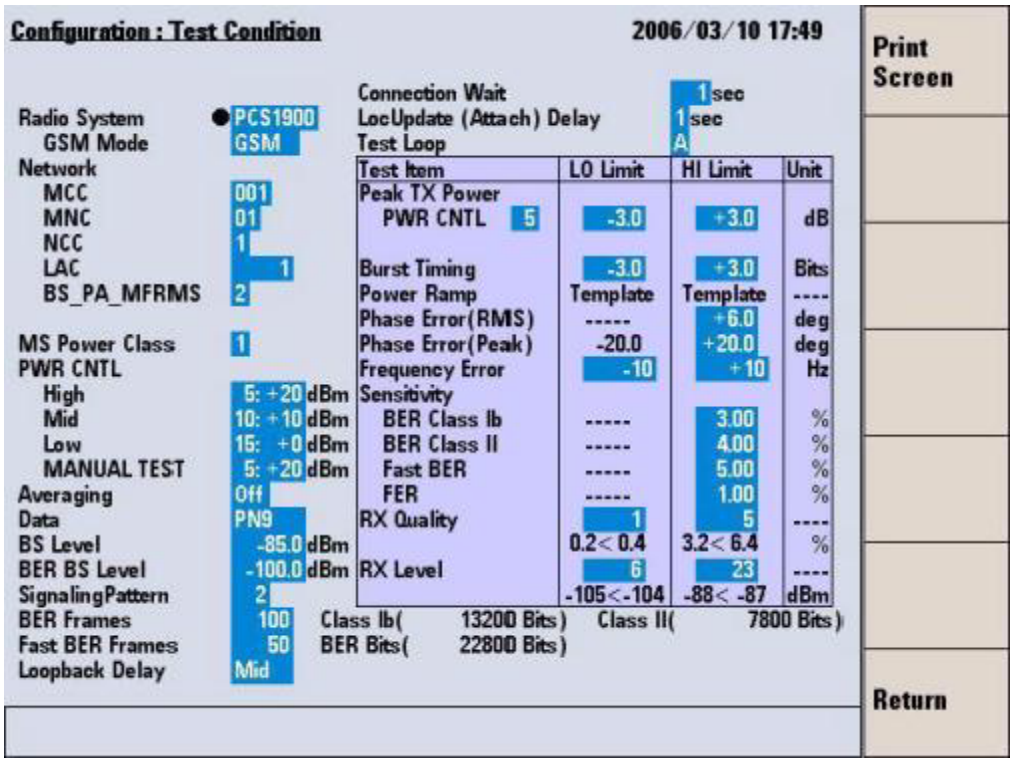
Figure 4-23 [Configuration] Screen



Step 4

Press the **Test Condition** softkey to display the [Configuration: Test Condition] screen for required setting in Manual Test GSM mode.

Figure 4-24 [Configuration: Test Condition] Screen


Configuration : Test Condition
2006/03/10 17:49
Print Screen
Return
Connection Wait 1 sec
LocUpdate (Attach) Delay 1 sec
Test Loop A
Radio System PCS1900
GSM Mode GSM
Network
MCC 001
MNC 01
NCC 1
LAC 1
BS_PA_MFRMS 2
MS Power Class 1
PWR CNTL
High 5: +20 dBm
Mid 10: +10 dBm
Low 15: +0 dBm
MANUAL TEST 5: +20 dBm
Averaging Off
Data PN9
BS Level -85.0 dBm
BER BS Level -100.0 dBm
SignalingPattern 2
BER Frames 100
Fast BER Frames 50
Loopback Delay Mid
Test Item | LO Limit | HI Limit | Unit
Peak TX Power
PWR CNTL 5 | -3.0 | +3.0 | dB
Burst Timing | -3.0 | +3.0 | Bits
Power Ramp | Template | Template | ----
Phase Error(RMS) | ----- | +6.0 | deg
Phase Error(Peak) | -20.0 | +20.0 | deg
Frequency Error | -10 | +10 | Hz
Sensitivity
BER Class Ib | ----- | 3.00 | %
BER Class II | ----- | 4.00 | %
Fast BER | ----- | 5.00 | %
FER | ----- | 1.00 | %
RX Quality | 1 | 5 | ----
0.2< 0.4 | 3.2< 6.4 | %
RX Level | 6 | 23 | ----
-105<-104 | -88< -87 | dBm
Class Ib(13200 Bits) Class II(7800 Bits)
BER Bits(22800 Bits)

Step 5

Set the input fields with the CURSOR CONTROL knob.

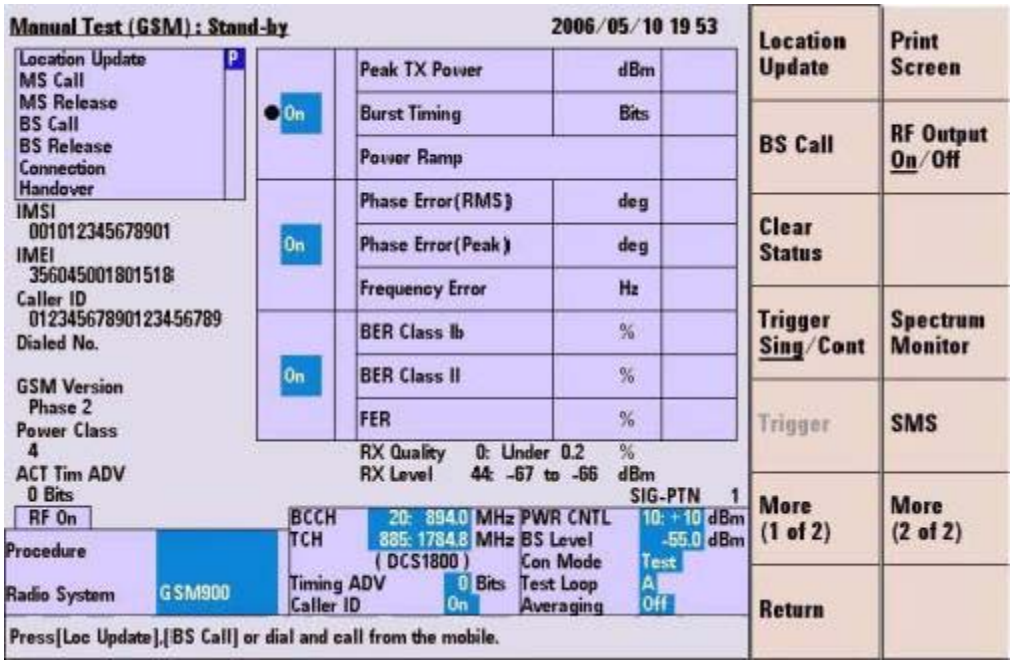
Step 6

Set the appropriate test limits in the cells of the test item table in the right side of the Figure 4-24.

Step 7

Press the **Return**, and **Return** again and then the **Manual Test** softkey to start Manual Test. The [Manual Test: Stand-by] screen as Figure 4-25 is displayed.

Figure 4-25 [Manual Test: Stand-by] Screen (GSM Mode)



Step 8

Turn the mobile phone on and wait for it to camp on, and **P** is shown at the **Location Update** step.

Step 9

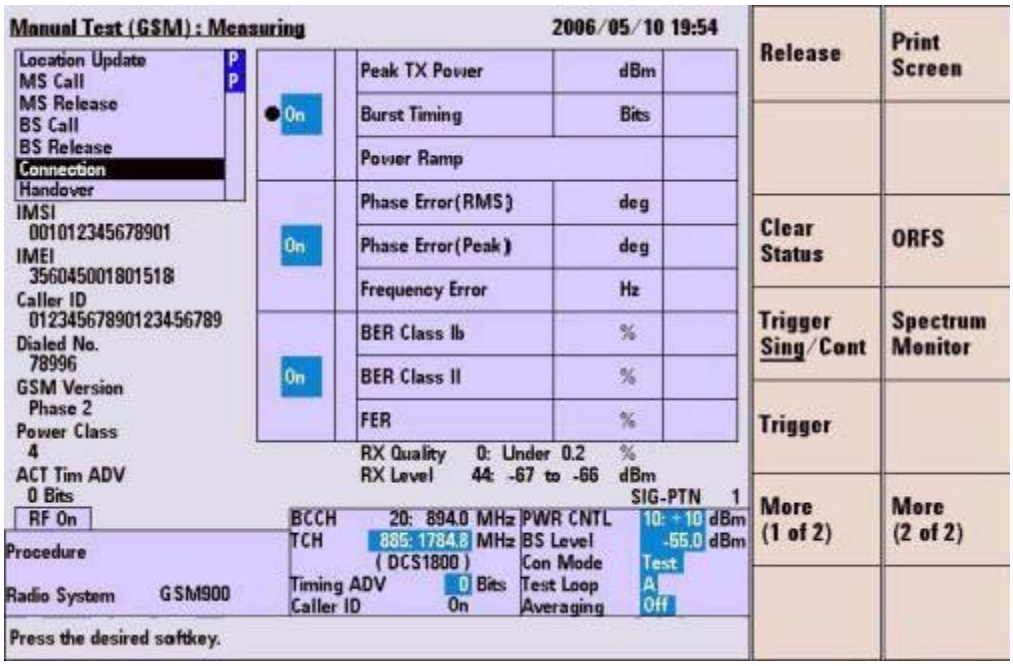
Start MS Call or BS Call with the following operation.

- Dial an arbitrary number and press the **Off Hook** button on the mobile phone.
- Press the **BS Call** softkey to start BS Call. Press **Off Hook** button on the mobile phone to respond to the call from the Tester.

Step 10

After MS call or BS call starts, the screen as Figure 4-26 will be displayed. **P** is shown at the **MS Call** or **BS Call** step, and **Connection** is highlighted.

Figure 4-26 [Measuring] MS Call Screen (GSM Mode)

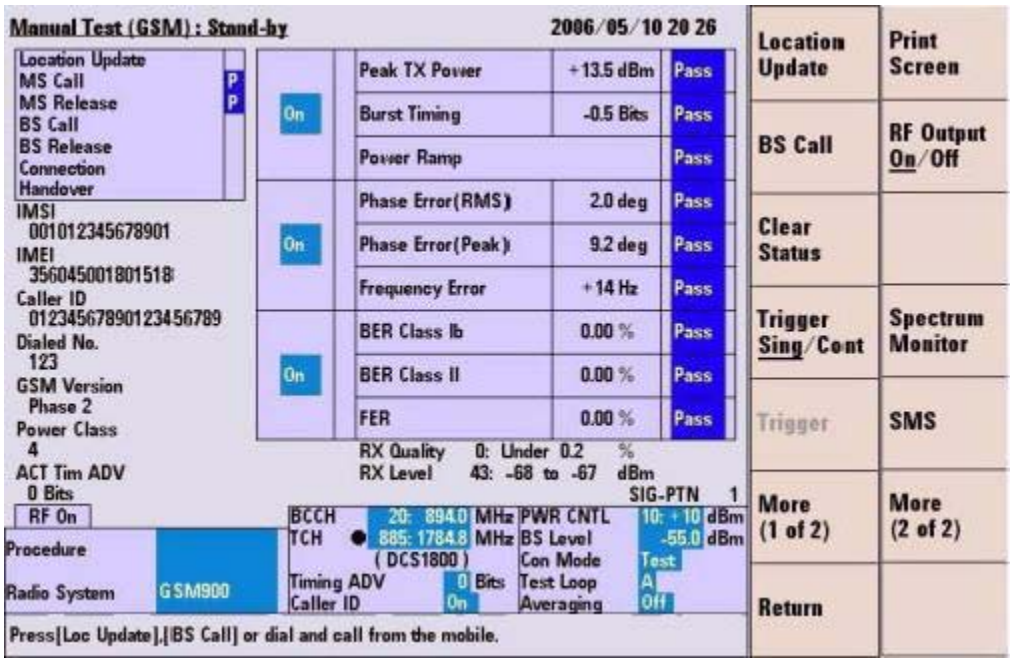


- If the trigger mode is set to `Cont` (continuous), continuous measurement starts immediately.
- If the trigger mode is set to `Sing` (single), press the **Trigger** softkey to start single measurement. Until measurement starts, the Tester loops back the voice from the mobile phone.

Step 11

After the measurement is completed, a [Measuring] summary screen containing test results is displayed.

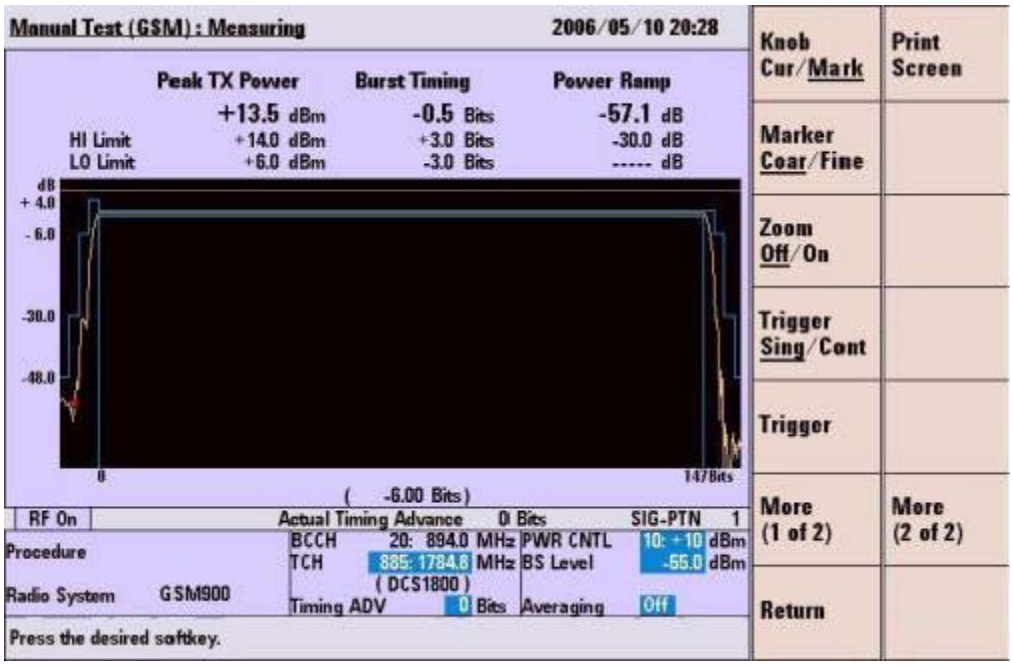
Figure 4-27 [Measuring] Summary Screen (GSM Mode)



Step 12

Select a group of measurement items with the CURSOR CONTROL knob to display the Graph/Value screen. Place the cursor at **Peak TX Power/Burst Timing/Power Ramp** and press the CURSOR CONTROL knob, for example, to display Figure 4-28.

Figure 4-28 [Measuring] Graph/ Value Screen (GSM Mode)



Step 13

Press a softkey as needed.

Knob Cur/Marker: Selects the cursor or the marker.

Marker Coar/Fine: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the amplitude and timeslot (in bits) is available at any point of the measurement trace.

Zoom Off/On: Selects the zoom mode from `On` and `Off`.

Trigger Sing/Cont: Selects the trigger mode from `Sing` to `Cont`.

- When the trigger mode is `Sing`, single measurement starts after the **Trigger** softkey is pressed.
- To change the trigger mode to `Cont` in order to start continuous measurement, press the **Trigger Sing/Cont** softkey.

Trigger: Starts single measurement when the trigger mode is set to `Sing`.

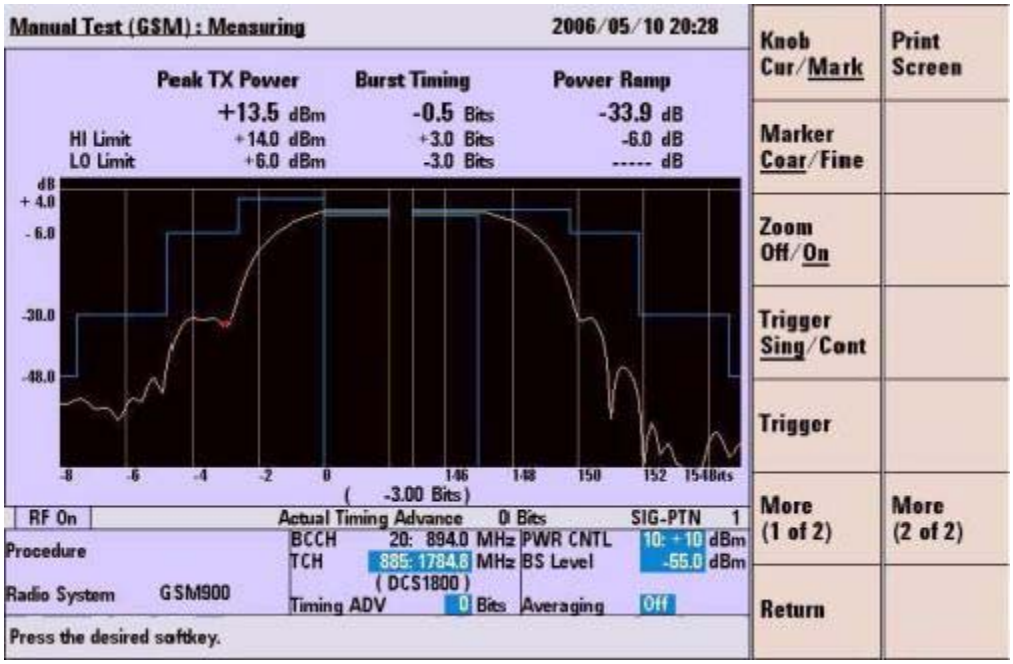
More (1 of 2): Displays the softkey menu 2.

Return: Returns to the previous screen.

Print Screen: Prints a hardcopy of the screen or saves it in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.

More (2 of 2): Returns to the softkey menu 1.

Figure 4-29 [Measuring] Graph/Value Zoomed Screen (GSM Mode)

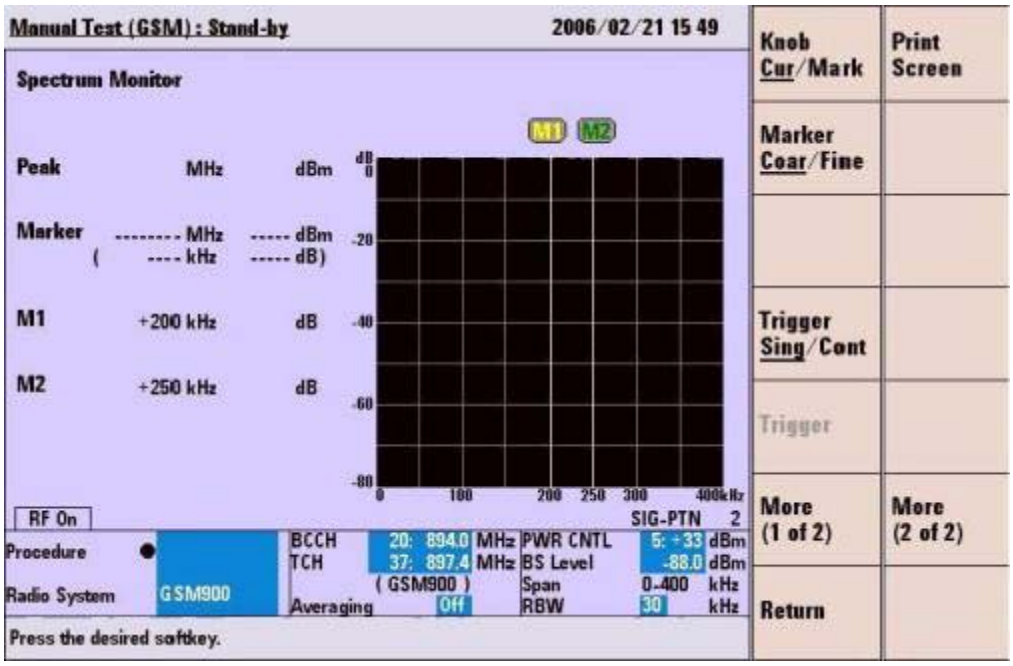


Press the **Return** softkey to return to the previous screen.

Step 14

Press the **More (1of 2)** and the **Spectrum Monitor** softkey to display the Spectrum Monitor screen.

Figure 4-30 [Measuring] Spectrum Monitor Screen (GSM Mode)



Step 15

Press the **Trigger** softkey to measure spectrum in single mode or the **Trigger Sing/Cont** softkey to measure the spectrum in continuous mode.

Step 16

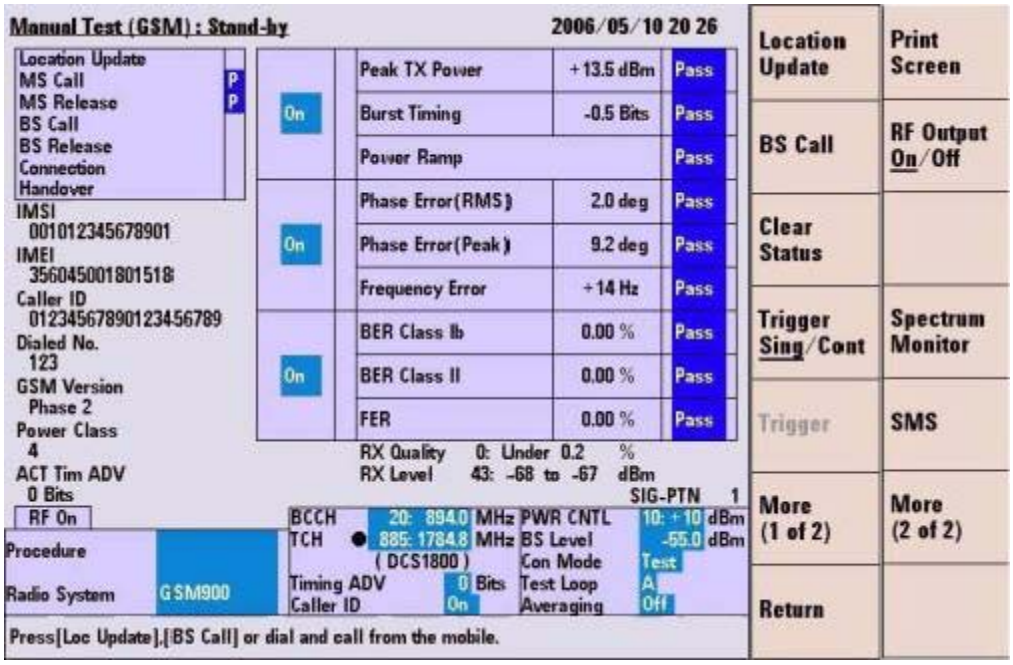
Press the **Return** softkey to return to the previous screen.

Step 17

Press the **Release** softkey to start BS release, or press the `On Hook` button on the mobile phone to start MS release.

After the release process is completed, the screen will return to the [Stand-by] screen. You can also display a Graph/Value screen from the [Stand-by] screen.

Figure 4-31 [Stand-by] After Release Screen (GSM Mode)



Handover

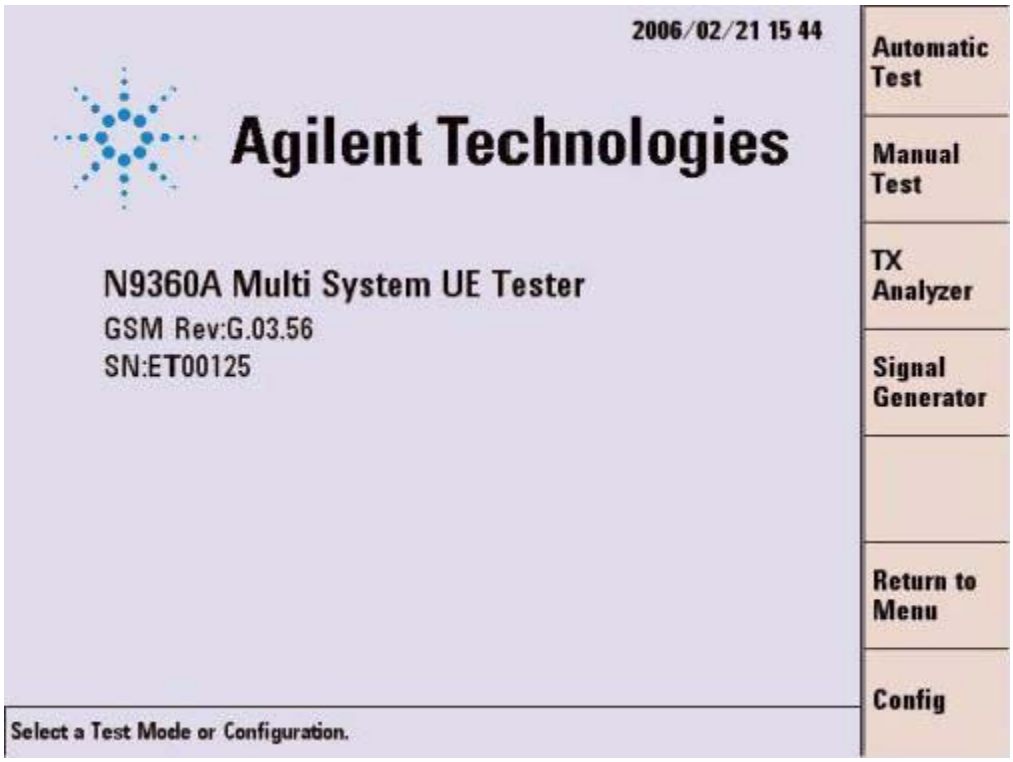
Step 1

Turn on the Tester and select the GSM system on the [Top Menu] screen. Refer to Selection of System on page 13 for selecting a system.

Step 2

The [Initial] screen as Figure 4-32 is displayed after completion of initialization and self-test routine of the Tester.

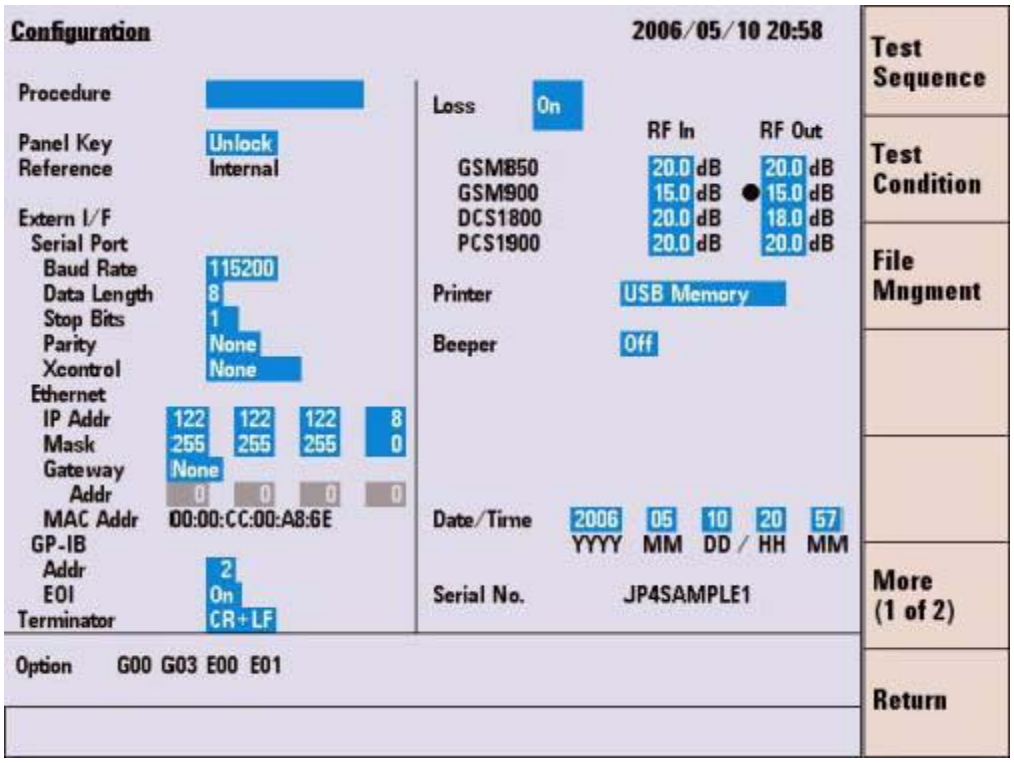
Figure 4-32 [Initial] Screen



Step 3

Press the **Config** softkey on the [Initial] screen to display the [Configuration] screen for specifying the **Loss** field.

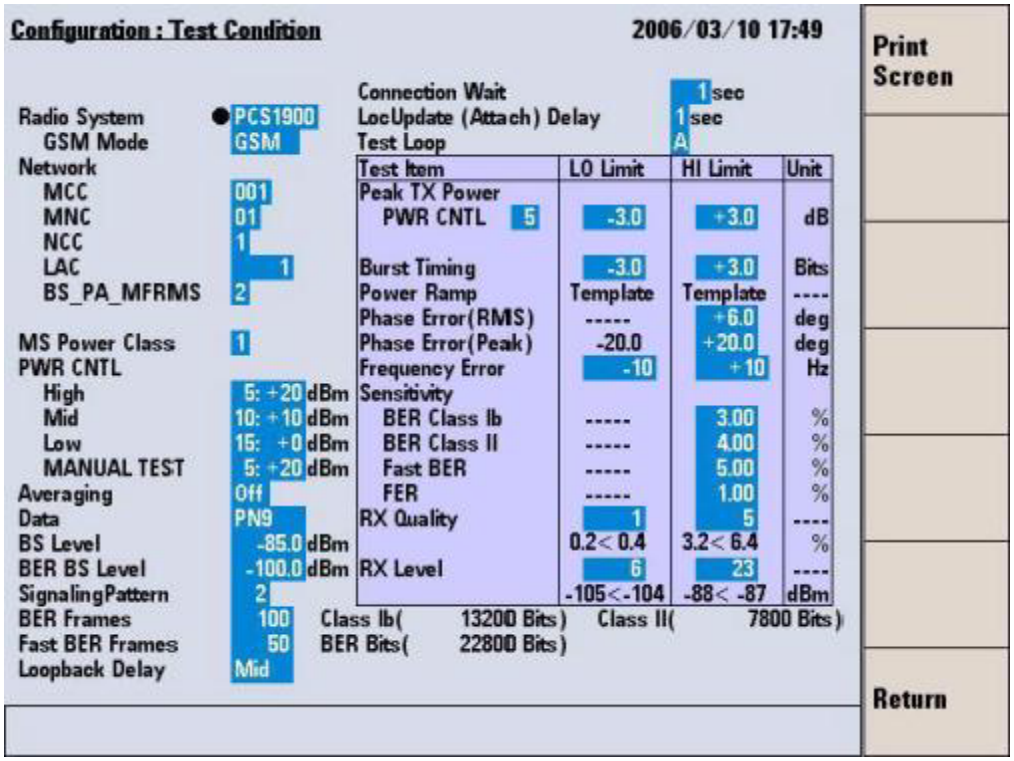
Figure 4-33 [Configuration] Screen



Step 4

Press the **Test Condition** softkey to display the [Configuration: Test Condition] screen for required setting in Manual Test GSM mode.

Figure 4-34 [Configuration: Test Condition] Screen


Configuration : Test Condition
2006/03/10 17:49
Print Screen
Return
Connection Wait 1 sec
LocUpdate (Attach) Delay 1 sec
Test Loop A
Radio System PCS1900
GSM Mode GSM
Network
MCC 001
MNC 01
NCC 1
LAC 1
BS_PA_MFRMS 2
MS Power Class 1
PWR CNTL
High 5: +20 dBm
Mid 10: +10 dBm
Low 15: +0 dBm
MANUAL TEST 5: +20 dBm
Averaging Off
Data PN9
BS Level -85.0 dBm
BER BS Level -100.0 dBm
SignalingPattern 2
BER Frames 100
Fast BER Frames 50
Loopback Delay Mid
Test Item | LO Limit | HI Limit | Unit
Peak TX Power
PWR CNTL 5 | -3.0 | +3.0 | dB
Burst Timing | -3.0 | +3.0 | Bits
Power Ramp | Template | Template | ----
Phase Error(RMS) | ----- | +6.0 | deg
Phase Error(Peak) | -20.0 | +20.0 | deg
Frequency Error | -10 | +10 | Hz
Sensitivity
BER Class Ib | ----- | 3.00 | %
BER Class II | ----- | 4.00 | %
Fast BER | ----- | 5.00 | %
FER | ----- | 1.00 | %
RX Quality | 1 | 5 | ----
0.2< 0.4 | 3.2< 6.4 | %
RX Level | 6 | 23 | ----
-105<-104 | -88< -87 | dBm
Class Ib(13200 Bits) Class II(7800 Bits)
BER Bits(22800 Bits)

Step 5

Set the input fields with the CURSOR CONTROL knob.

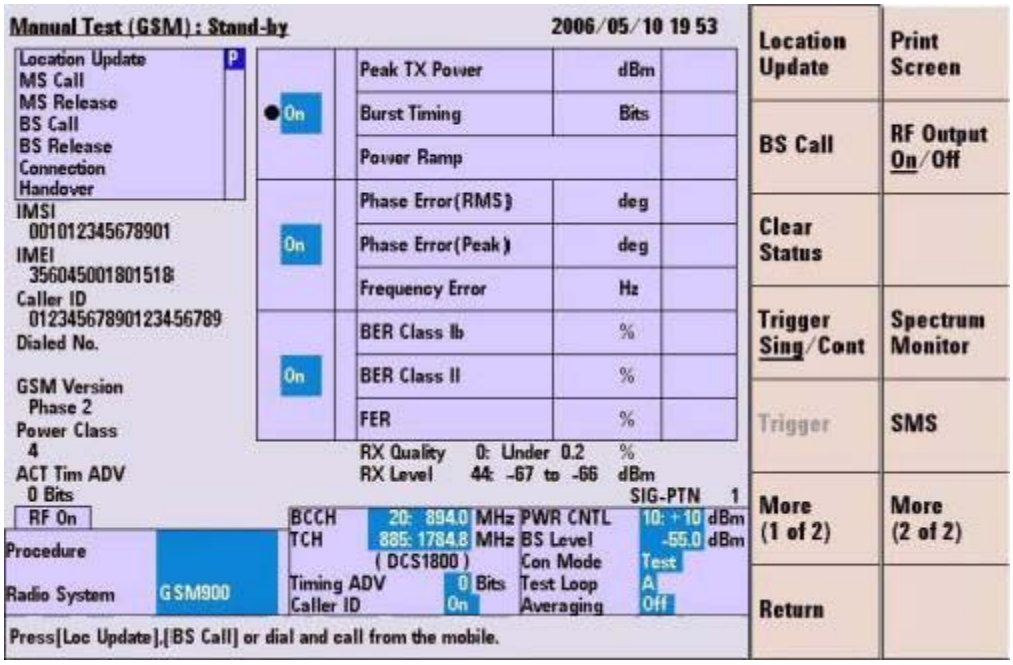
Step 6

Set the appropriate test limits in the cells of the test item table in the right side of the Figure 4-34

Step 7

Press the **Return**, and **Return** again and then the **Manual Test** softkey to start Manual Test. The [Manual Test: Stand-by] screen as Figure 4-35 displayed.

Figure 4-35 [Manual Test: Stand-by] Screen (GSM Mode)



Step 8

Turn the mobile phone on and **P** is shown at the **Location Update** step.

Step 9

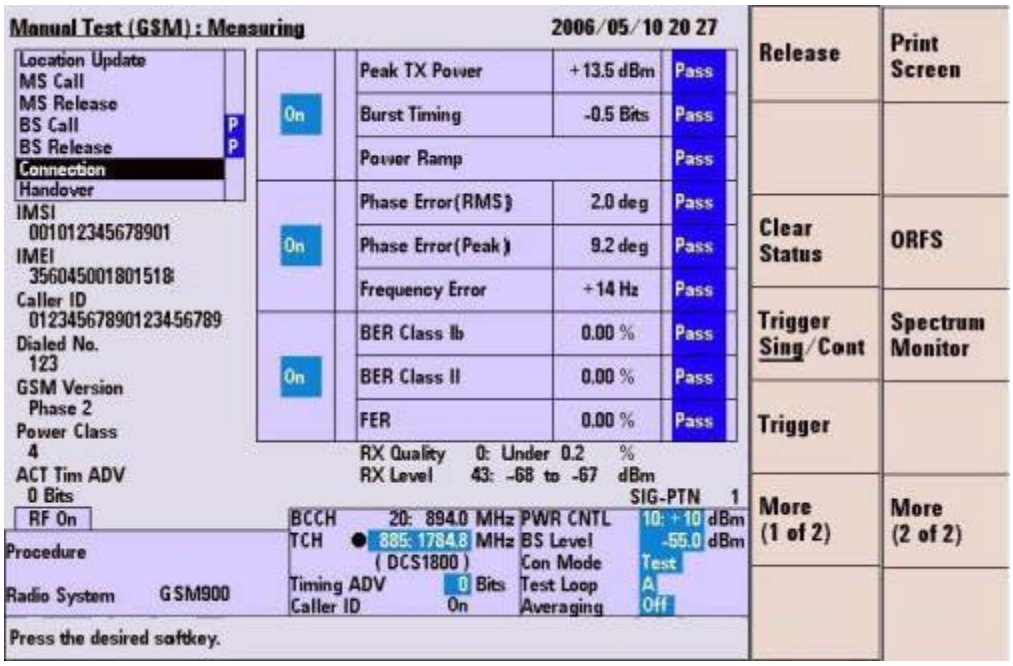
Start BS Call or MS Call with the following operation.

- Press the **BS Call** softkey to start BS Call. Press the **Off Hook** button on the mobile phone to respond to the call from the Tester.
- Dial an arbitrary number and press the **Off Hook** button on the mobile phone.

Step 10

After MS call or BS Call starts, the screen as Figure 4-36 will be displayed. **P** is shown in the **MS Call**, **BS Call** and **Connection** step is highlighted.

Figure 4-36 [Measuring] BS Call Screen (GSM Mode)

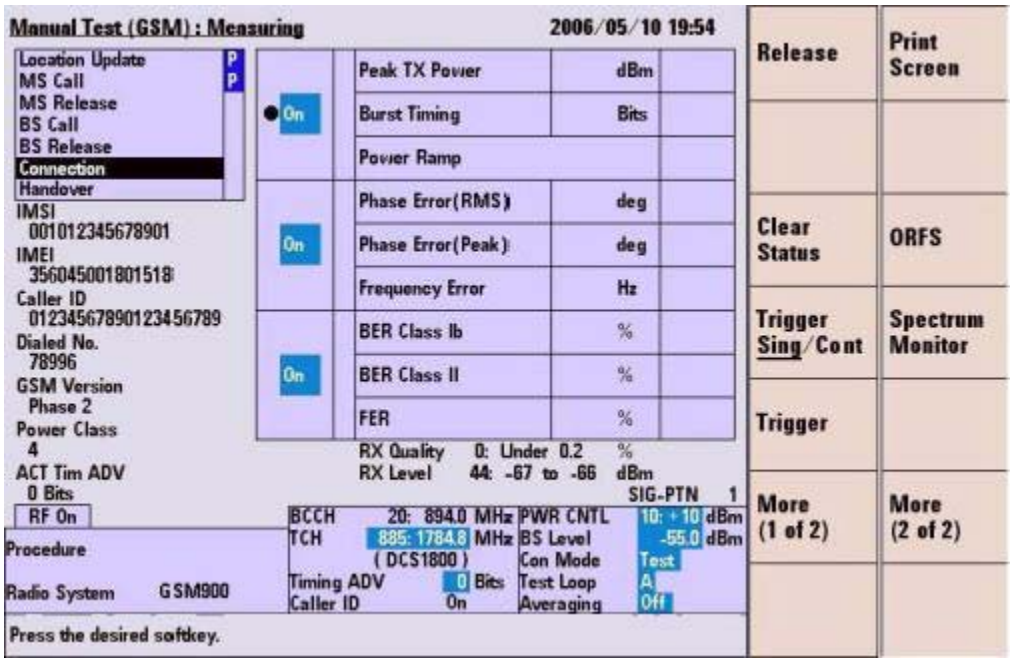


- If the trigger mode is set to `Cont` (continuous), continuous measurement starts immediately.
- If the trigger mode is set to `Sing` (single), press the **Trigger** softkey to start single measurement. Until measurement starts, the Tester loops back the voice from the mobile phone.

Step 11

After the measurement is completed, a [Measuring] summary screen containing test results is displayed.

Figure 4-37 [Measuring] Summary Screen (GSM Mode)



Step 12

Change the channel with the following operation.

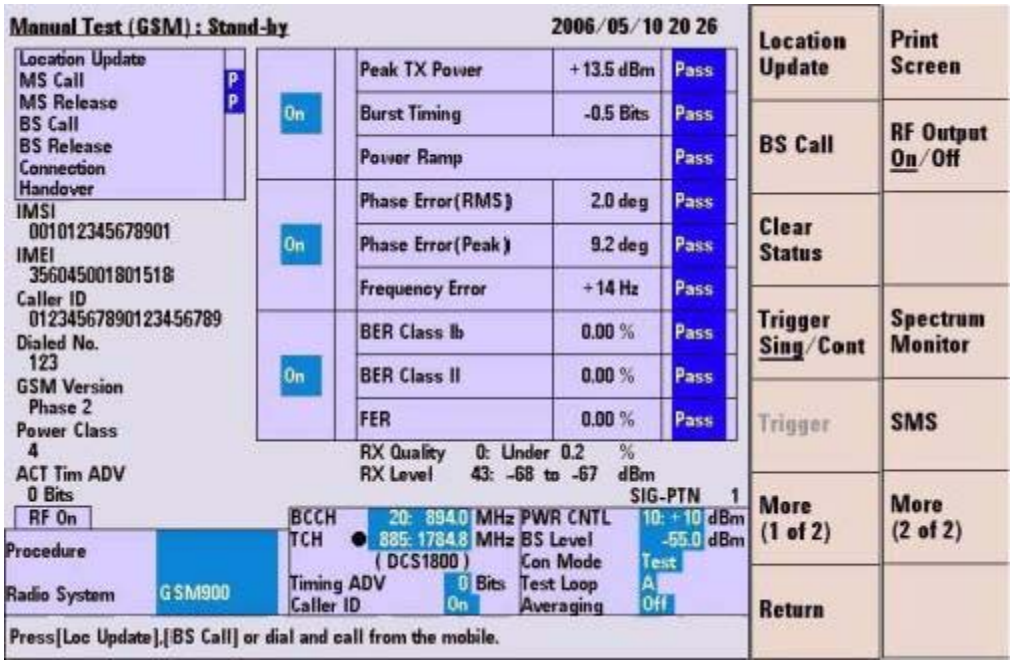
Move the cursor to **TCH** input field and press the CURSOR CONTROL knob. Rotate the CURSOR CONTROL knob to select the channel for handover. Press the CURSOR CONTROL knob. Then, the **Handover** step is highlighted and the channel changes to the selected channel. When handover is completed, **P** is shown at the Handover step.

Step 13

Press the **Release** softkey to start BS release, or press the `On Hook` button on the mobile phone to start MS release.

After the release process is completed, the screen will return to the [Stand-by] screen. You can also display a [Graph/Value] screen from the [Stand-by] screen.

Figure 4-38 [Stand-by] After Release Screen (GSM Mode)



Emergency Call

NOTE

To test the emergency call function, place the mobile phone and the Tester where the radio signal (electromagnetic wave) from base station of a cell phone operator does not propagate, such as in a shield room, an anechoic chamber, and etc.

Execute the test of emergency call without any SIM.

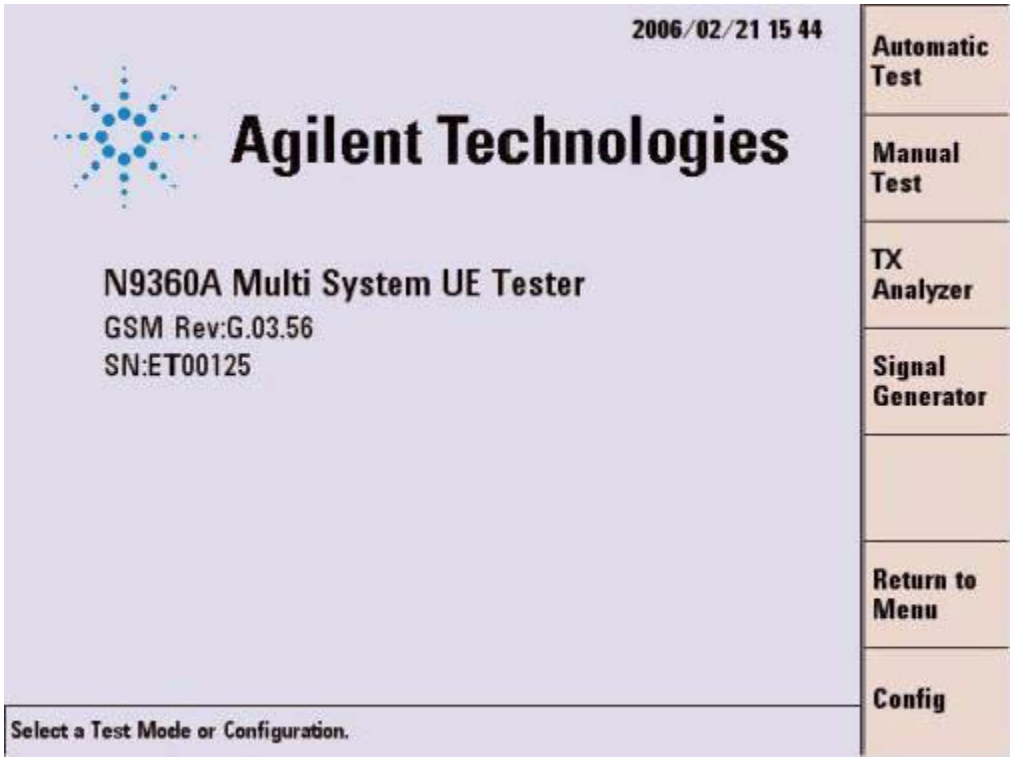
Step 1

Turn on the Tester and select the GSM system on the [Top Menu] screen. Refer to Selection of System on page 13 for selecting a system.

Step 2

The [Initial] screen as Figure 4-39 is displayed after completion of initialization and self-test routine of the Tester.

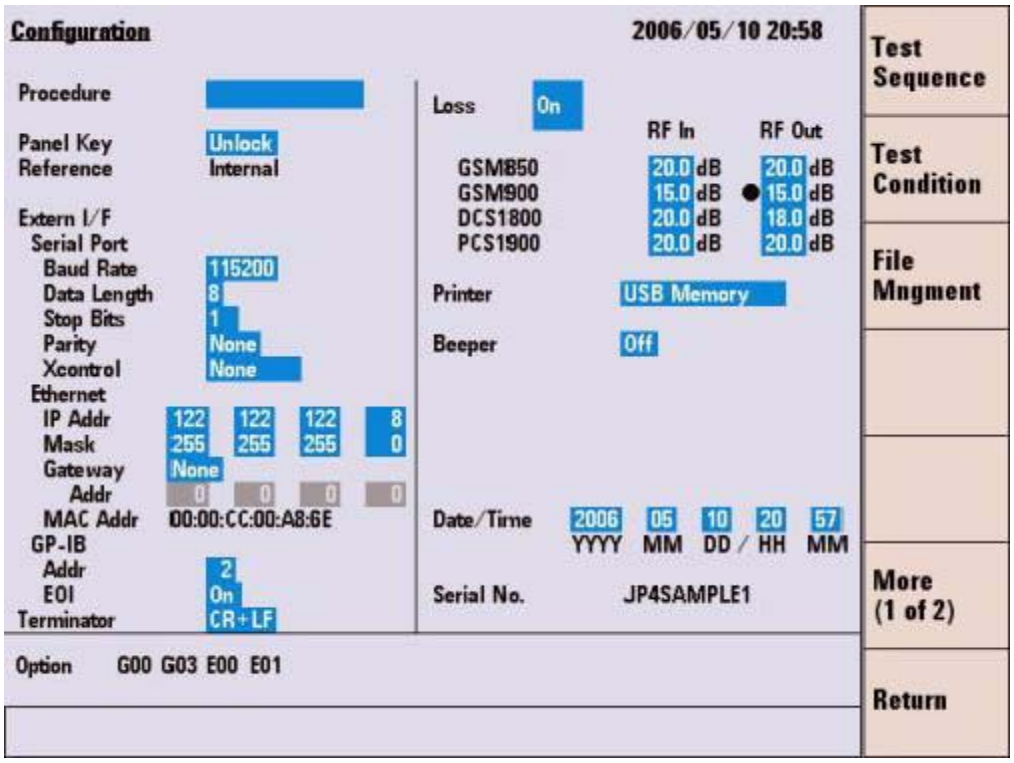
Figure 4-39 [Initial] Screen



Step 3

Press the **Config** softkey on the [Initial] screen to display the [Configuration] screen for specifying the **Loss** field.

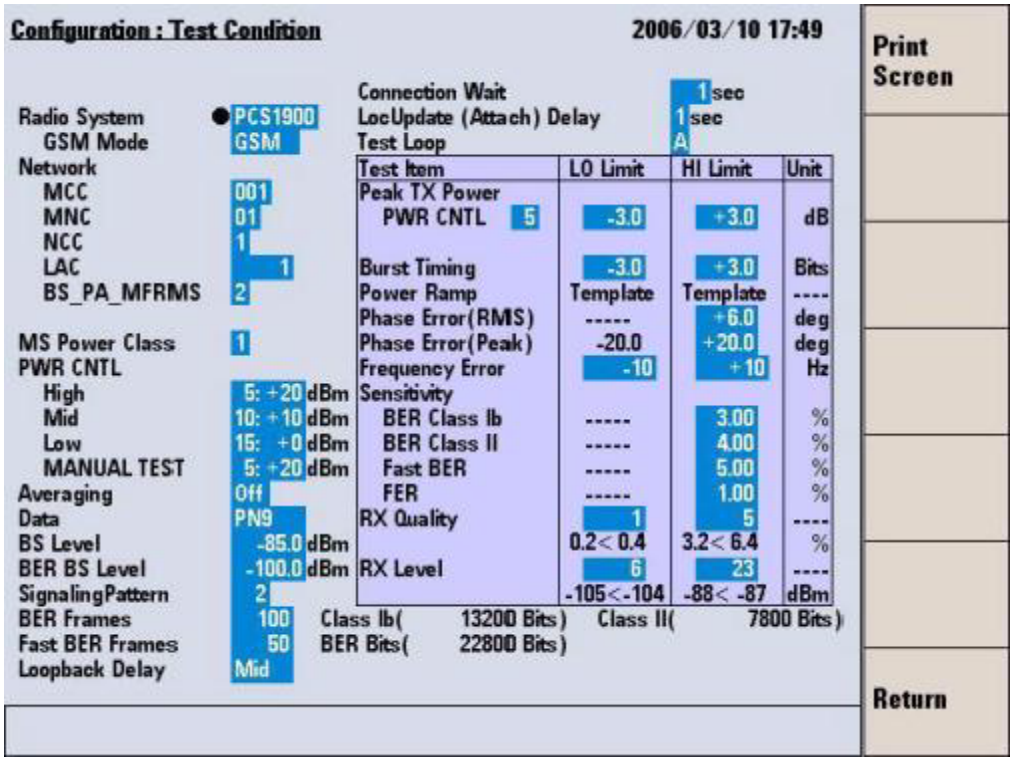
Figure 4-40 [Configuration] Screen



Step 4

Press the **Test Condition** softkey to display the [Configuration: Test Condition] screen for required setting in Manual Test GSM mode.

Figure 4-41 [Configuration: Test Condition] Screen


Configuration : Test Condition
2006/03/10 17:49
Print Screen
Return
Connection Wait 1 sec
LocUpdate (Attach) Delay 1 sec
Test Loop A
Radio System PCS1900
GSM Mode GSM
Network
MCC 001
MNC 01
NCC 1
LAC 1
BS_PA_MFRMS 2
MS Power Class 1
PWR CNTL
High 5: +20 dBm
Mid 10: +10 dBm
Low 15: +0 dBm
MANUAL TEST 5: +20 dBm
Averaging Off
Data PN9
BS Level -85.0 dBm
BER BS Level -100.0 dBm
SignalingPattern 2
BER Frames 100
Fast BER Frames 50
Loopback Delay Mid
Test Item | LO Limit | HI Limit | Unit
Peak TX Power
PWR CNTL 5 | -3.0 | +3.0 | dB
Burst Timing | -3.0 | +3.0 | Bits
Power Ramp | Template | Template | ----
Phase Error(RMS) | ----- | +6.0 | deg
Phase Error(Peak) | -20.0 | +20.0 | deg
Frequency Error | -10 | +10 | Hz
Sensitivity
BER Class Ib | ----- | 3.00 | %
BER Class II | ----- | 4.00 | %
Fast BER | ----- | 5.00 | %
FER | ----- | 1.00 | %
RX Quality | 1 | 5 | ----
0.2< 0.4 | 3.2< 6.4 | %
RX Level | 6 | 23 | ----
-105<-104 | -88< -87 | dBm
Class Ib(13200 Bits) Class II(7800 Bits)
BER Bits(22800 Bits)

Step 5

Set the input fields with the CURSOR CONTROL knob.

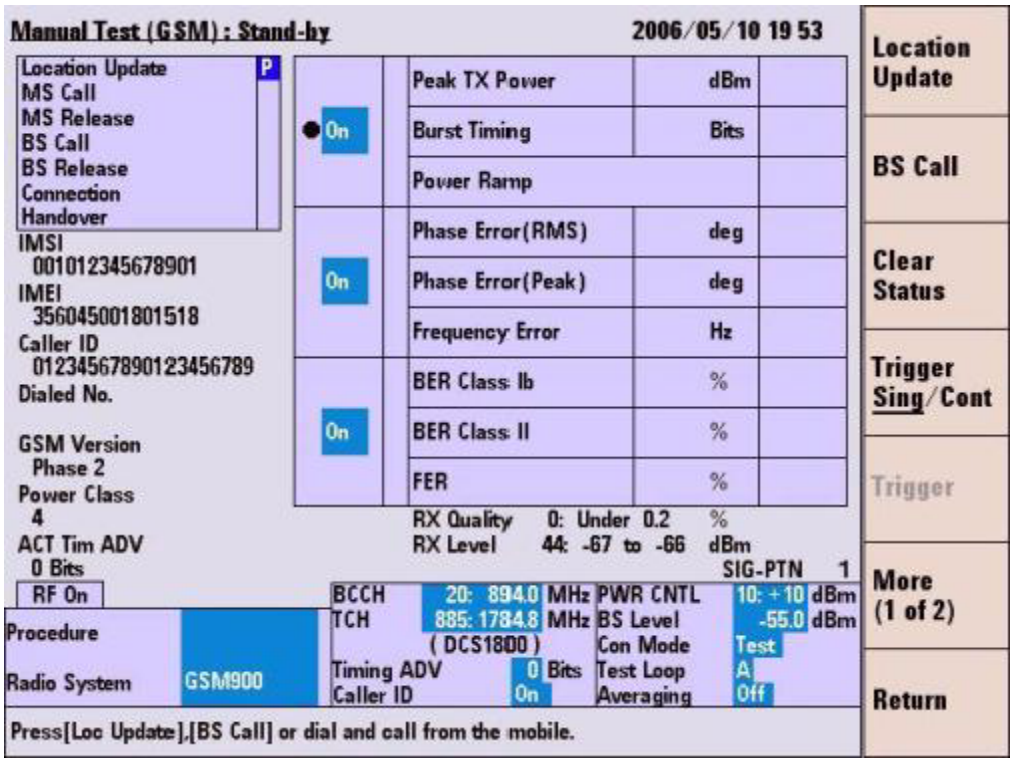
Step 6

Set the appropriate test limits in the cells of the test item table in the right side of the Figure 4-41

Step 7

Press the **Return**, and **Return** again and then the **Manual Test** softkey to start Manual Test. The [Manual Test: Stand-by] screen as Figure 4-42 displayed.

Figure 4-42 [Manual Test: Stand-by] Screen (GSM Mode)



Step 8

Turn the mobile phone on and **P** is shown at the **Location Update** step.

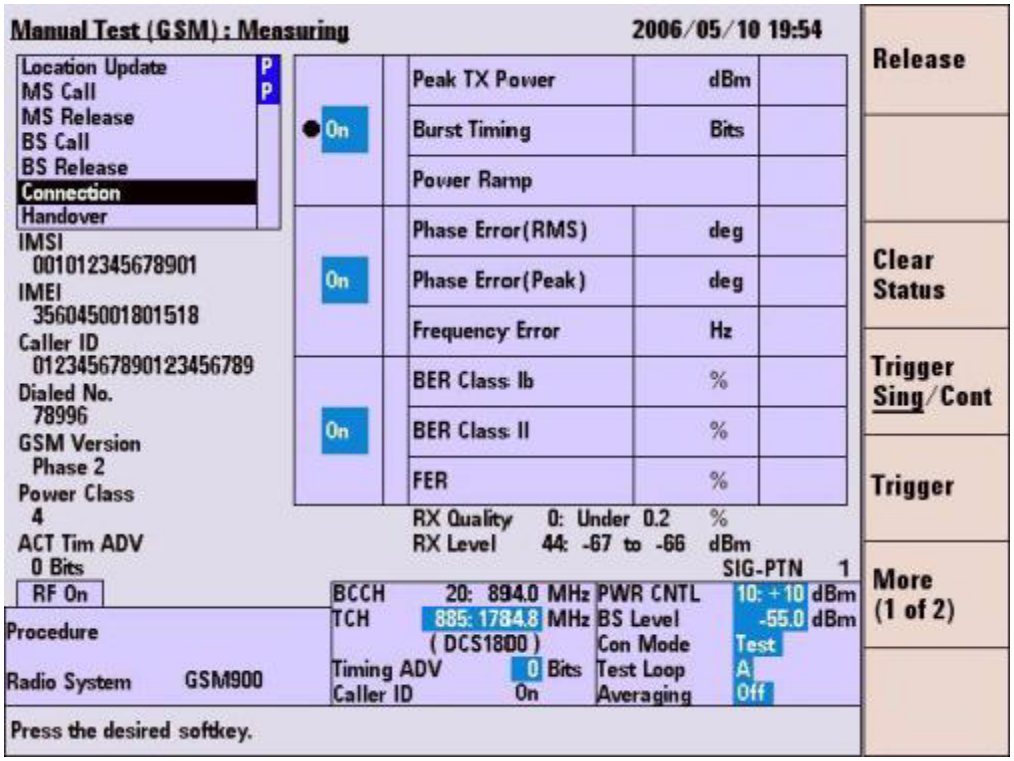
Step 9

Dial an emergency call number and press the **Off Hook** button on the mobile phone to start MS Call.

Step 10

After MS call starts, the screen as Figure 4-43 will be displayed. **Emergency Call** is displayed at the **Dialed No.:** field on the screen. **P** is shown in the **MS Call** and **Connection** is highlighted.

Figure 4-43 [Measuring] MS Call Emergency Call Screen (GSM Mode)

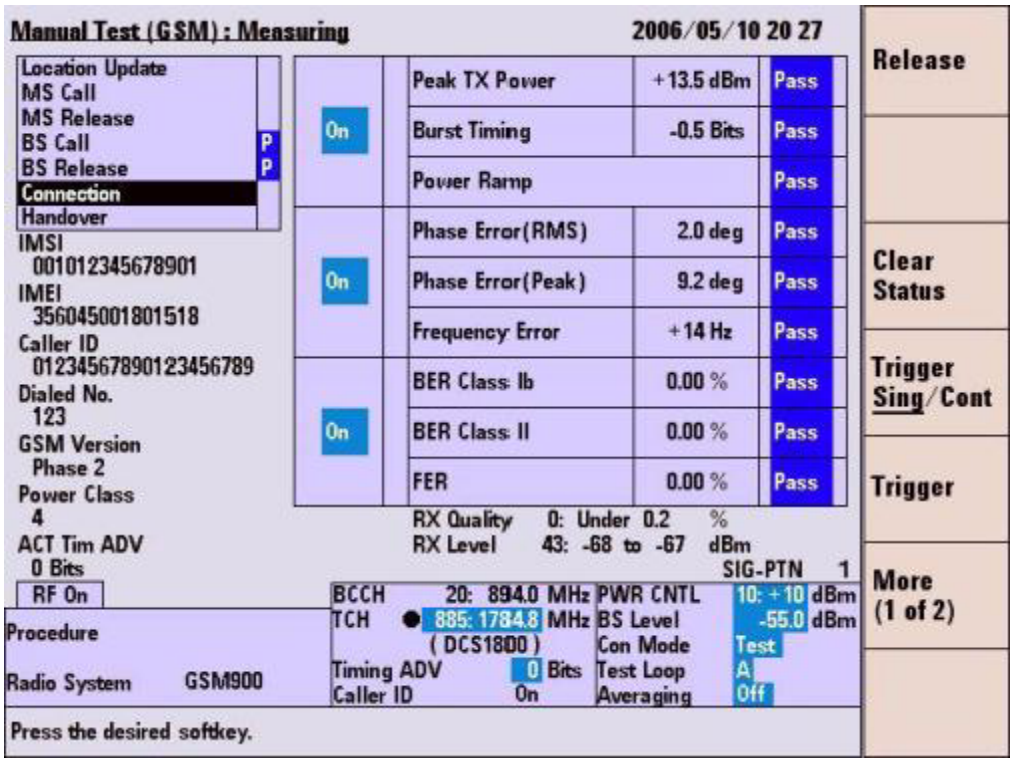


- If the trigger mode is set to `Cont` (continuous), continuous measurement starts immediately.
- If the trigger mode is set to `Sing` (single), press the **Trigger** softkey to start single measurement. Until measurement starts, the Tester loops back the voice from the mobile phone.

Step 11

After the measurement is completed, a [Measuring] summary screen containing test results is displayed.

Figure 4-44 [Measuring] Emergency Call Summary Screen (GSM Mode)

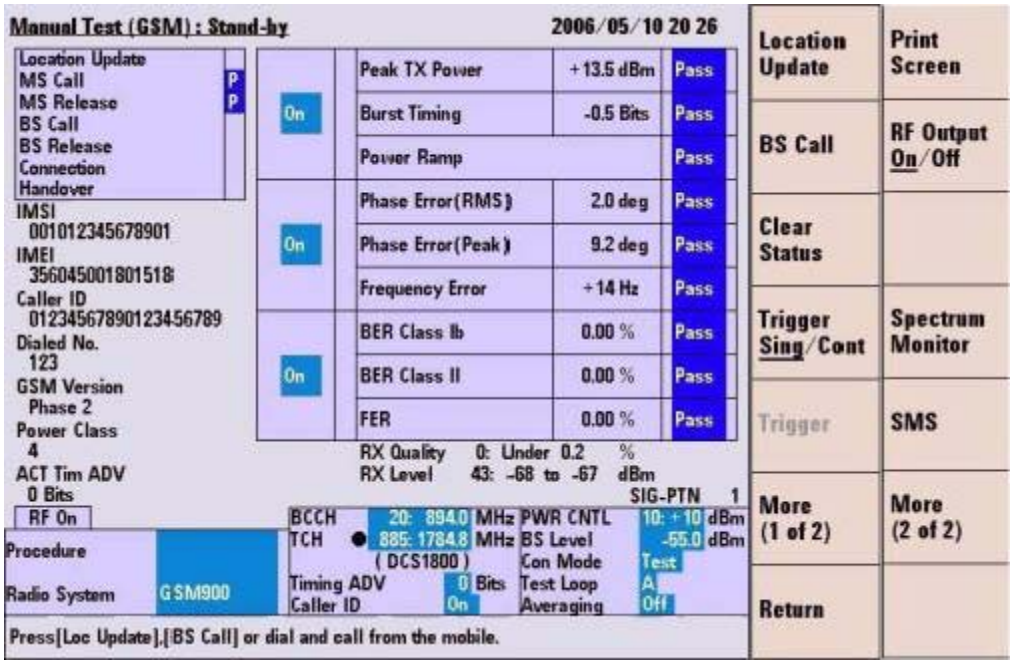


Step 12

Press the **Release** softkey to start BS release, or press the **On Hook** button on the mobile phone to start MS release.

After the release process is completed, the screen will return to the [Stand-by] screen. You can also display a Graph/Value screen from the [Stand-by] screen.

Figure 4-45 [Stand-by] After Release Screen (GSM Mode)



Testing a Mobile Phone by Manual Test (GPRS Mode)

This section describes the operation method of the Tester and a mobile phone under the test by the Manual Test GPRS mode.

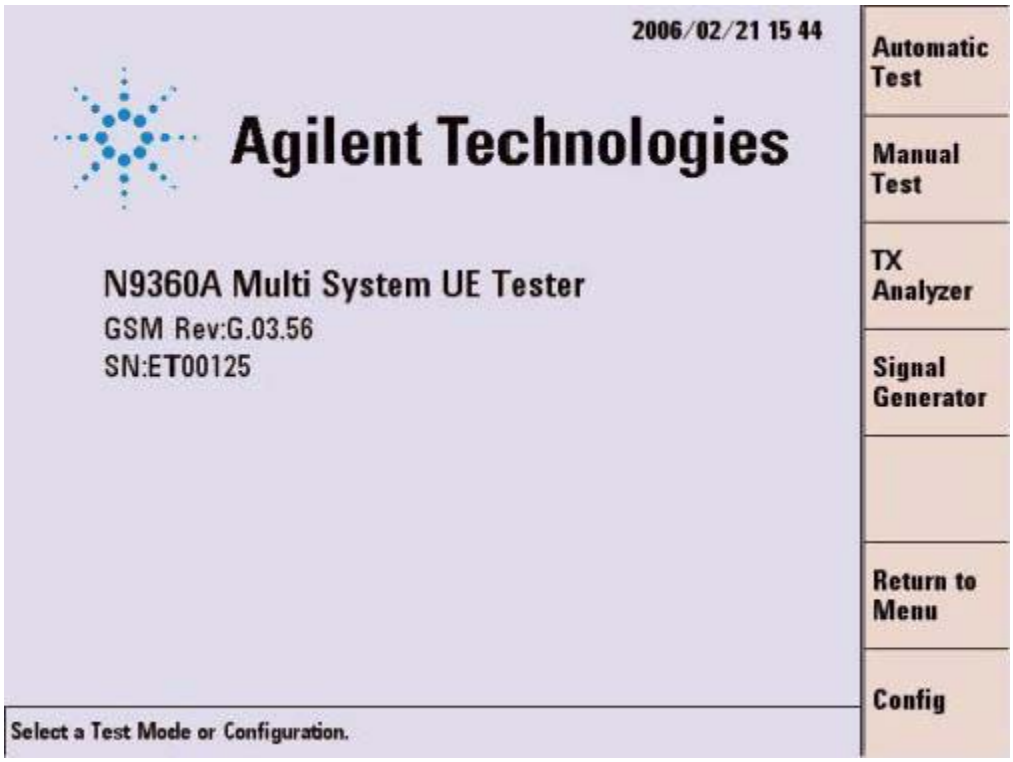
Step 1

Turn on the Tester and select the GSM system on the [Top Menu] screen. Refer to Selection of System on page 13 for selecting a system.

Step 2

The [Initial] screen as Figure 4-46 is displayed after completion of initialization and self-test routine of the Tester.

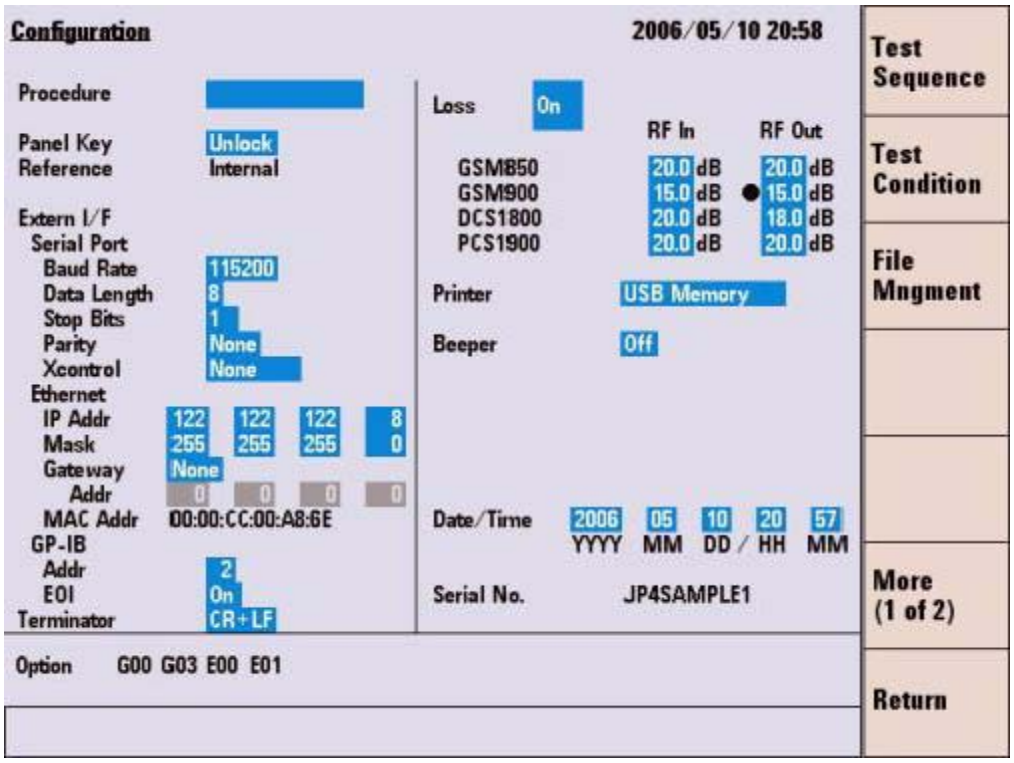
Figure 4-46 [Initial] Screen



Step 3

Press the **Config** softkey on the [Initial] screen to display the [Configuration] screen for specifying the **Loss** field.

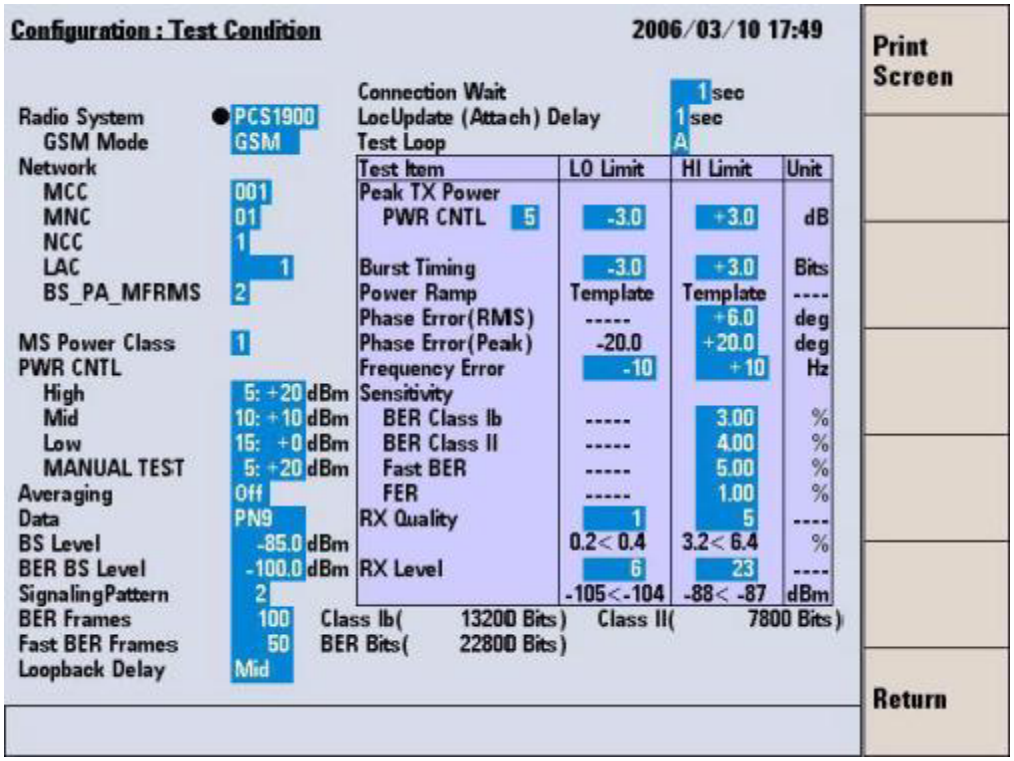
Figure 4-47 [Configuration] Screen



Step 4

Press the **Test Condition** softkey to display the [Configuration: Test Condition] screen for required setting in Manual Test GPRS mode.

Figure 4-48 [Configuration: Test Condition] Screen


Configuration : Test Condition
2006/03/10 17:49
Print Screen
Return
Connection Wait 1 sec
LocUpdate (Attach) Delay 1 sec
Test Loop A
Radio System PCS1900
GSM Mode GSM
Network
MCC 001
MNC 01
NCC 1
LAC 1
BS_PA_MFRMS 2
MS Power Class 1
PWR CNTL
High 5: +20 dBm
Mid 10: +10 dBm
Low 15: +0 dBm
MANUAL TEST 5: +20 dBm
Averaging Off
Data PN9
BS Level -85.0 dBm
BER BS Level -100.0 dBm
SignalingPattern 2
BER Frames 100
Fast BER Frames 50
Loopback Delay Mid
Test Item | LO Limit | HI Limit | Unit
Peak TX Power
PWR CNTL 5 | -3.0 | +3.0 | dB
Burst Timing | -3.0 | +3.0 | Bits
Power Ramp | Template | Template | ----
Phase Error(RMS) | ----- | +6.0 | deg
Phase Error(Peak) | -20.0 | +20.0 | deg
Frequency Error | -10 | +10 | Hz
Sensitivity
BER Class Ib | ----- | 3.00 | %
BER Class II | ----- | 4.00 | %
Fast BER | ----- | 5.00 | %
FER | ----- | 1.00 | %
RX Quality | 1 | 5 | ----
0.2< 0.4 | 3.2< 6.4 | %
RX Level | 6 | 23 | ----
-105<-104 | -88< -87 | dBm
Class Ib(13200 Bits) Class II(7800 Bits)
BER Bits(22800 Bits)

Step 5

Set the input fields with the CURSOR CONTROL knob. Set the **GSM Mode** to `GPRS`.

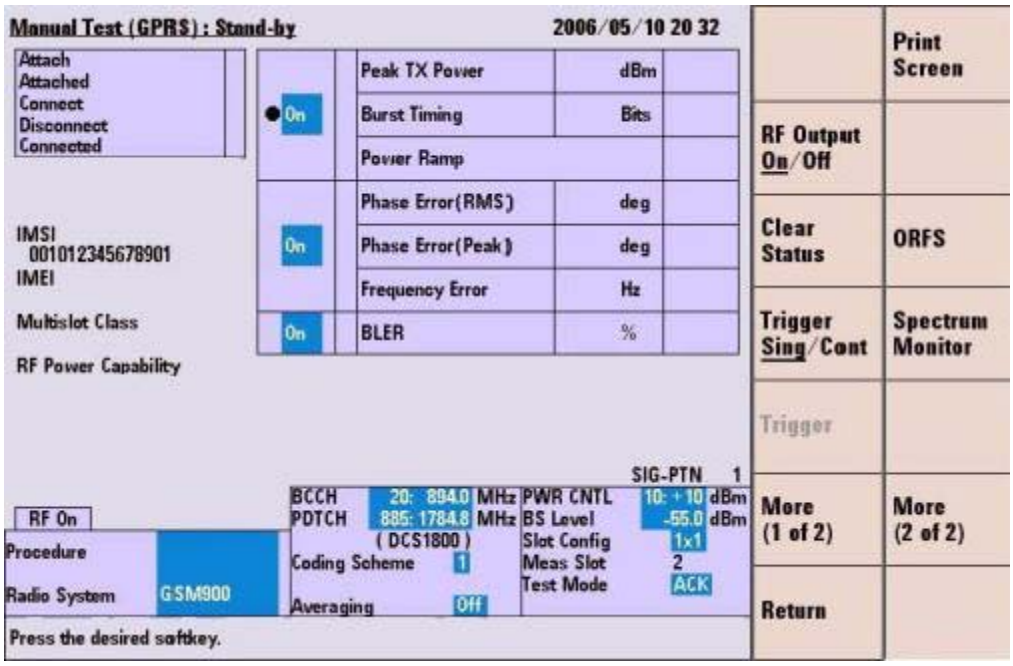
Step 6

Set appropriate test limits in the cells of the test items as shown in Figure 4-48. For testing BLER, set the upper limit value.

Step 7

Press the **Return**, and **Return** again and then the **Manual Test** softkey to start Manual Test. The [Manual Test: Stand-by] screen as Figure 4-49 displayed.

Figure 4-49 [Manual Test: Stand-by] GPRS Mode Screen



Step 8

Check the difference in the test flow, the parameters for slot configuration, and the **Sensitivity** field as compared to those for the Manual test GSM mode.

Step 9

Specify the input fields of the test parameters as shown in Figure 4-49.

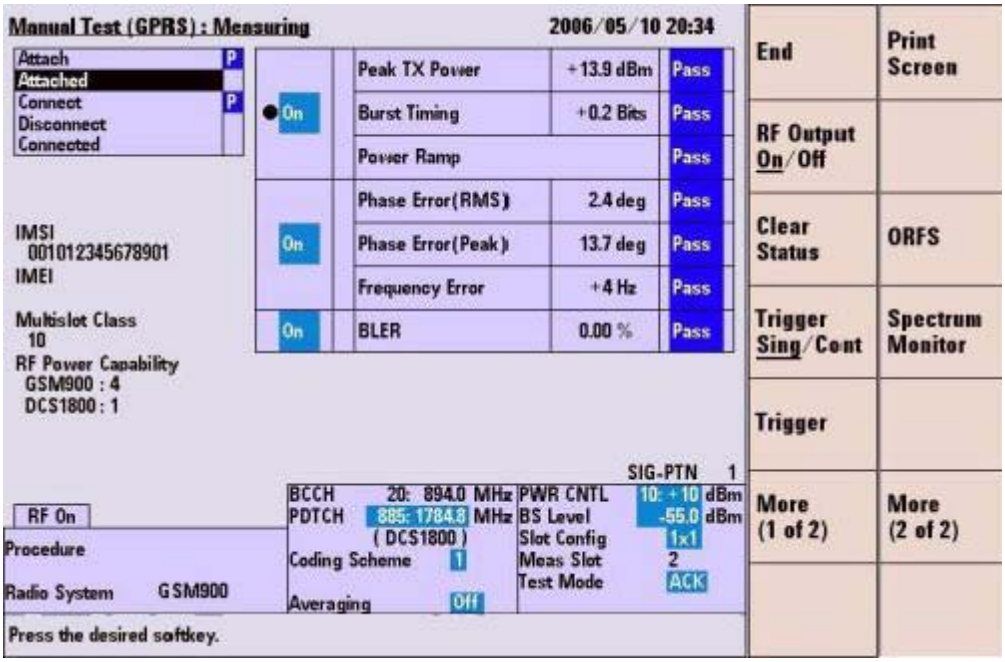
Step 10

Turn the mobile phone on and wait for it to camp on, and **P** is shown in the **Attach** step.

Step 11

Upon completion of the attaching process, the [Manual Test: Measuring] screen is displayed as shown in Figure 4-50.

Figure 4-50 [Measuring] Attached Screen (GPRS Mode)



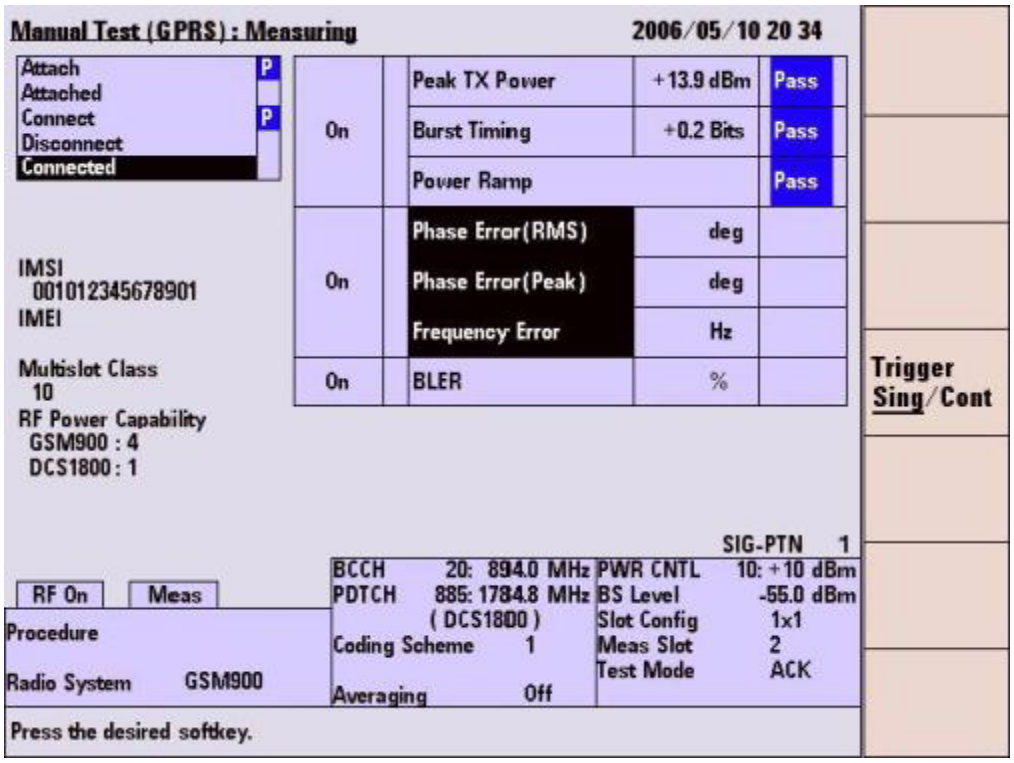
Step 12

When the attached process is succeeded, the Tester waits for the trigger.

- When the trigger mode is `Sing`, single measurement will start after the **Trigger** softkey is pressed.
- To change the trigger mode to `Cont` in order to start continuous measurement, press the **Trigger Sing/Cont** softkey.

  The [Manual Test: Measuring] connected screen is displayed as Figure 4-51.

Figure 4-51 [Measuring] Connected Screen (GPRS Mode)



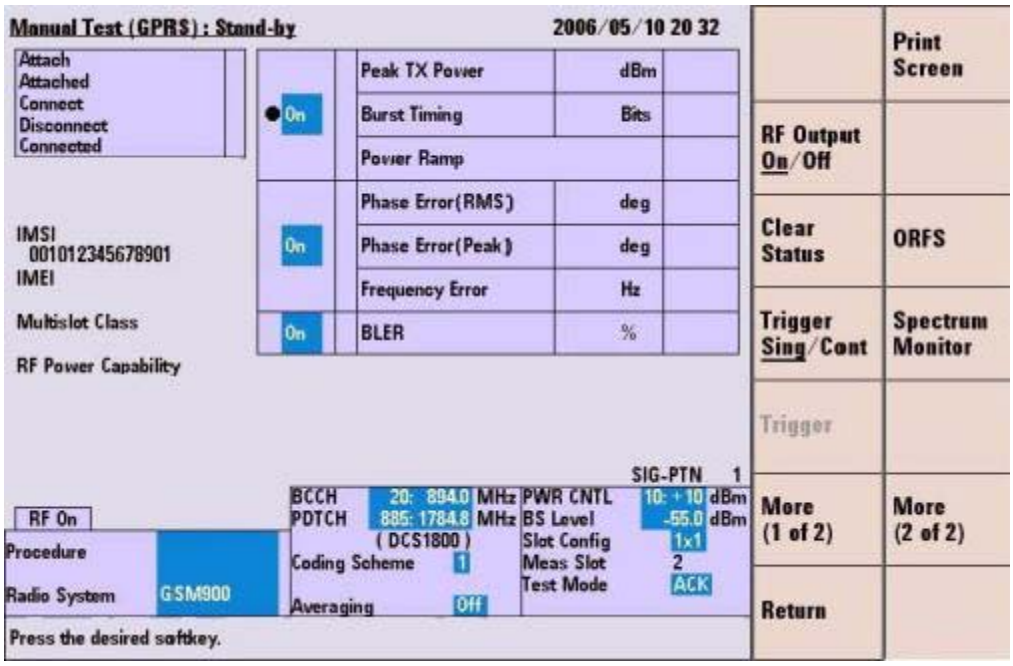
Step 13

During continuous measurement, change the trigger mode from `Cont` to `Sing` to terminate the measurement. Upon completion of the measurement at the **Connected** step, the step proceeds to the **Disconnect** step.

Step 14

The screen automatically changes to a [Measuring] summary screen containing test results.

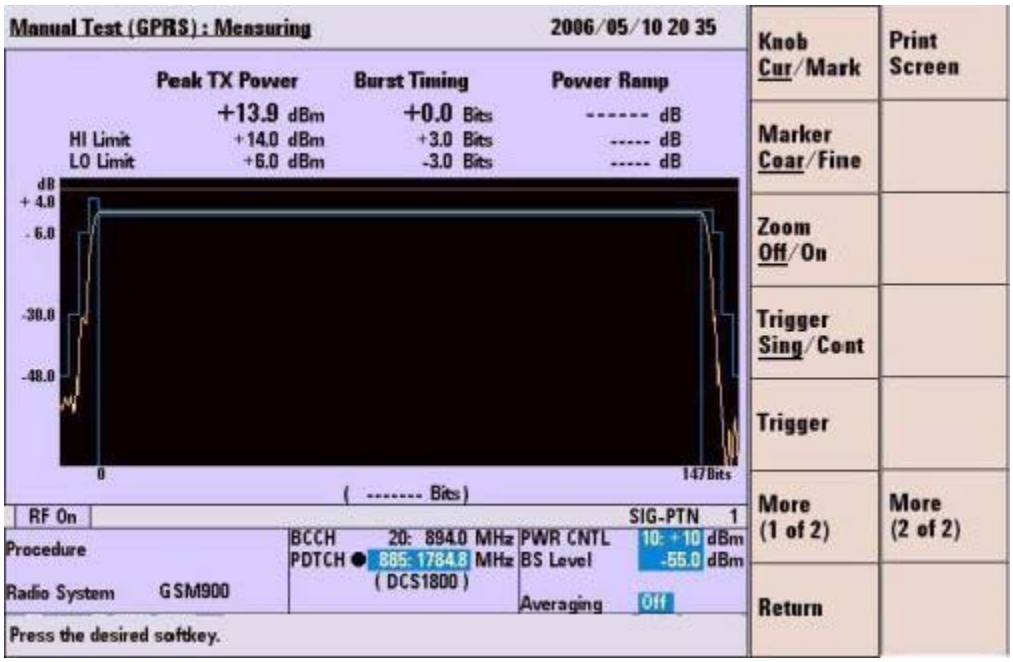
Figure 4-52 [Measuring] Summary Screen (GPRS Mode)



Step 15

Select a group of measurement items with the CURSOR CONTROL knob to display the Graph/Value screen. Place the cursor at **Peak TX Power/Burst Timing/Power Ramp** and press the CURSOR CONTROL knob, for example, to display the Figure 4-53.

Figure 4-53 [Measuring] Graph/Value Screen (GPRS Mode)



Step 16

Press a softkey as needed.

Knob Cur/Marker: Selects the cursor or the marker.

Marker Coar/Fine: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the amplitude and timeslot (in bits) is available at any point of the measurement trace.

Zoom Off/On: Selects the zoom mode from `On` and `Off`.

Trigger Sing/Cont: Selects the trigger mode from `Sing` to `Cont`.

- When the trigger mode is `Sing`, single measurement starts after the **Trigger** softkey is pressed.
- To change the trigger mode to `Cont` in order to start continuous measurement, press the **Trigger Sing/Cont** softkey.

Trigger: Starts single measurement when the trigger mode is set to `Sing`.

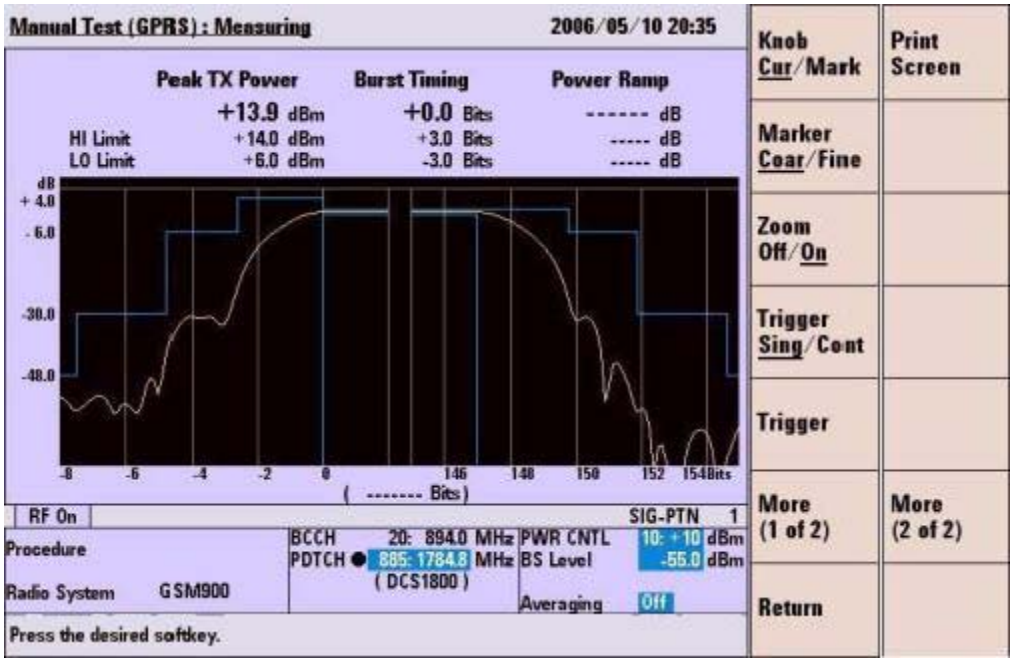
More (1 of 2): Displays the softkey menu 2.

Return: Returns to the previous screen.

Print Screen: Prints a hardcopy of the screen or saves it in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.

More (2 of 2): Returns to the softkey menu 1.

Figure 4-54 [Measuring] Graph/Value Zoomed Screen (GPRS Mode)

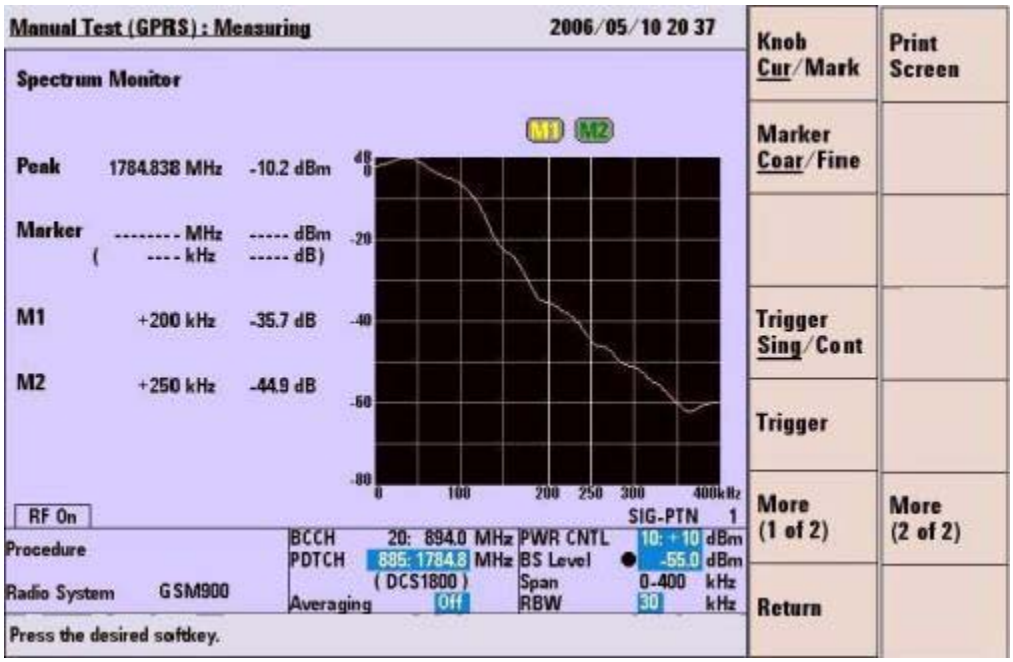


Press the **Return** softkey to return to the previous screen.

Step 17

Press the **More (1 of 2)** and the **Spectrum Monitor** softkey to display the Spectrum Monitor screen.

Figure 4-55 [Measuring] Spectrum Monitor Screen (GPRS Mode)



Step 18

Press the **Trigger** softkey to measure spectrum in single mode, or the **Trigger Sing/Cont** softkey to measure the spectrum in continuous mode.

Step 19

Press the **Return** softkey to return to the previous screen.

Step 20

Press the **End** softkey to finish the test.

Testing a Mobile Phone by Manual Test (EGPRS Mode)

This section describes the operation method of the Tester and a mobile phone under the test by the Manual Test EGPRS mode.

NOTE Install the Option G03 before using EGPRS function.

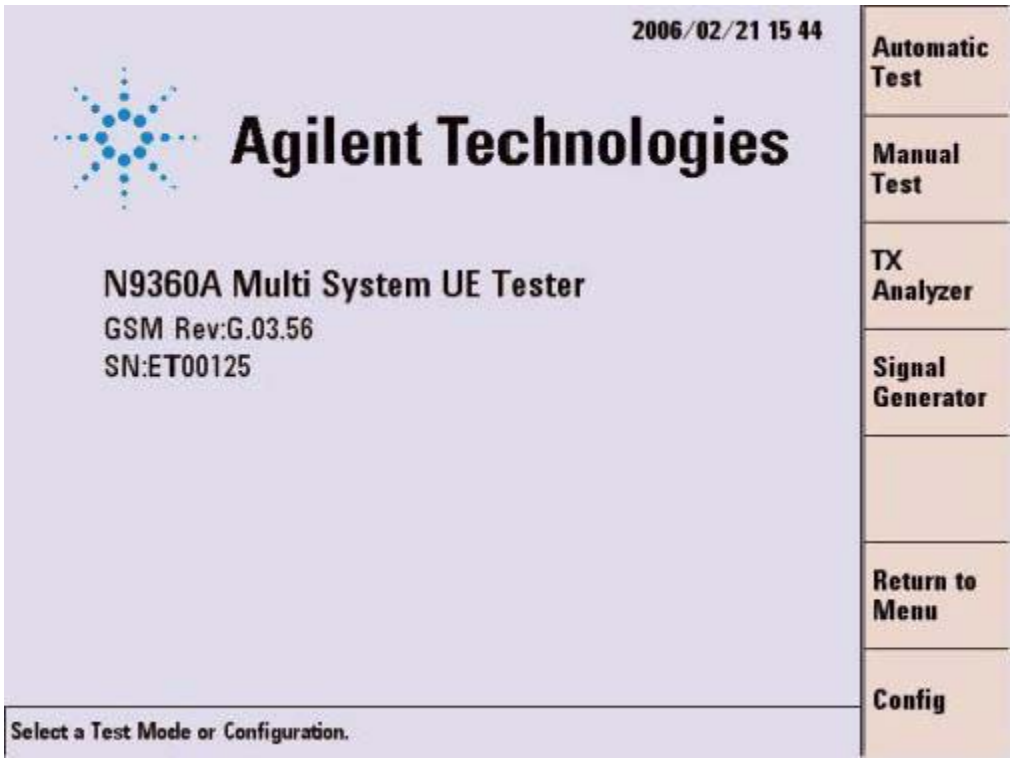
Step 1

Turn on the Tester and select the GSM system on the [Top Menu] screen. Refer to Selection of System on page 13 for selecting a system.

Step 2

The [Initial] screen as Figure 4-56 is displayed after completion of initialization and self-test routine of the Tester.

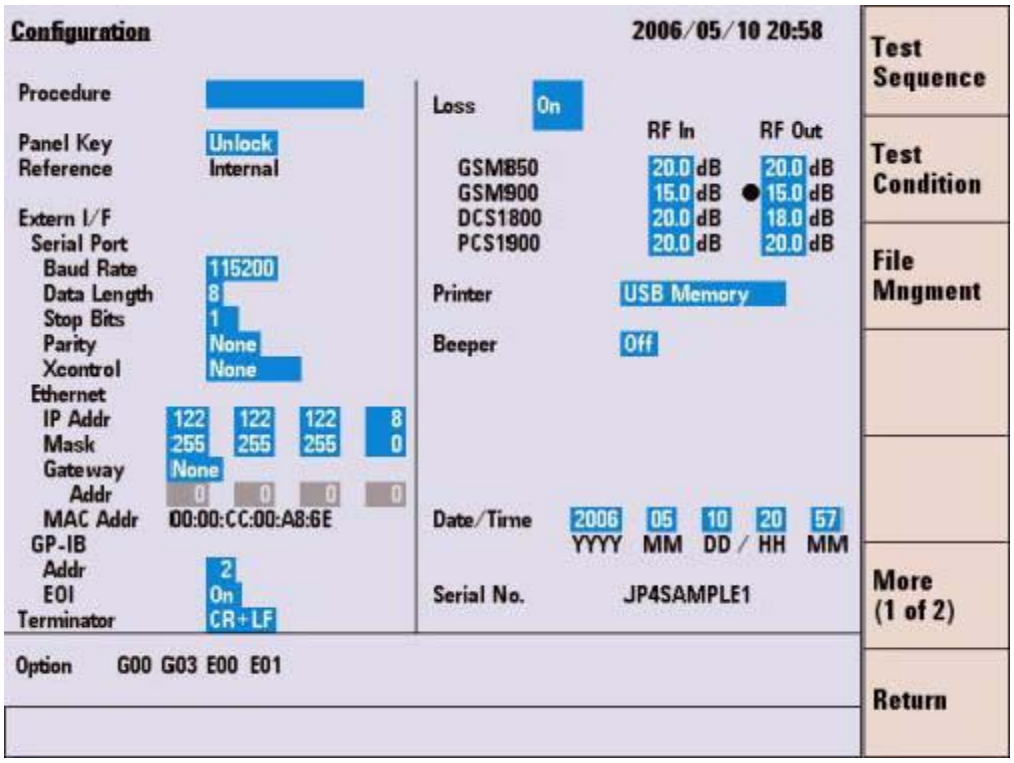
Figure 4-56 [Initial] Screen



Step 3

Press the **Config** softkey on the [Initial] screen to display the [Configuration] screen for specifying the **Loss** field.

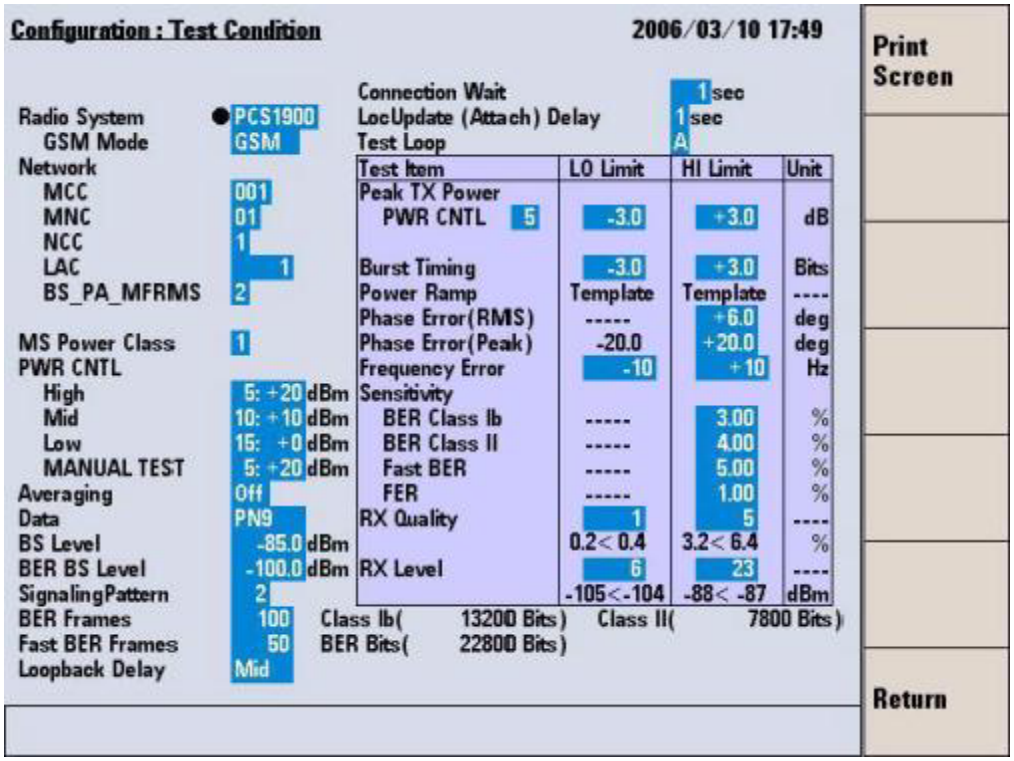
Figure 4-57 [Configuration] Screen



Step 4

Press the **Test Condition** softkey to display the [Configuration: Test Condition] screen for required setting in Manual Test EGPRS mode.

Figure 4-58 [Configuration: Test Condition] Screen


Configuration : Test Condition
2006/03/10 17:49
Print Screen
Return
Connection Wait 1 sec
LocUpdate (Attach) Delay 1 sec
Test Loop A
Radio System PCS1900
GSM Mode GSM
Network
MCC 001
MNC 01
NCC 1
LAC 1
BS_PA_MFRMS 2
MS Power Class 1
PWR CNTL
High 5: +20 dBm
Mid 10: +10 dBm
Low 15: +0 dBm
MANUAL TEST 5: +20 dBm
Averaging Off
Data PN9
BS Level -85.0 dBm
BER BS Level -100.0 dBm
SignalingPattern 2
BER Frames 100
Fast BER Frames 50
Loopback Delay Mid
Test Item | LO Limit | HI Limit | Unit
Peak TX Power
PWR CNTL 5 | -3.0 | +3.0 | dB
Burst Timing | -3.0 | +3.0 | Bits
Power Ramp | Template | Template | ----
Phase Error(RMS) | ----- | +6.0 | deg
Phase Error(Peak) | -20.0 | +20.0 | deg
Frequency Error | -10 | +10 | Hz
Sensitivity
BER Class Ib | ----- | 3.00 | %
BER Class II | ----- | 4.00 | %
Fast BER | ----- | 5.00 | %
FER | ----- | 1.00 | %
RX Quality | 1 | 5 | ----
0.2< 0.4 | 3.2< 6.4 | %
RX Level | 6 | 23 | ----
-105<-104 | -88< -87 | dBm
Class Ib(13200 Bits) Class II(7800 Bits)
BER Bits(22800 Bits)

Step 5

Set the input fields with the CURSOR CONTROL knob. Set the **GSM Mode** to EGPRS.

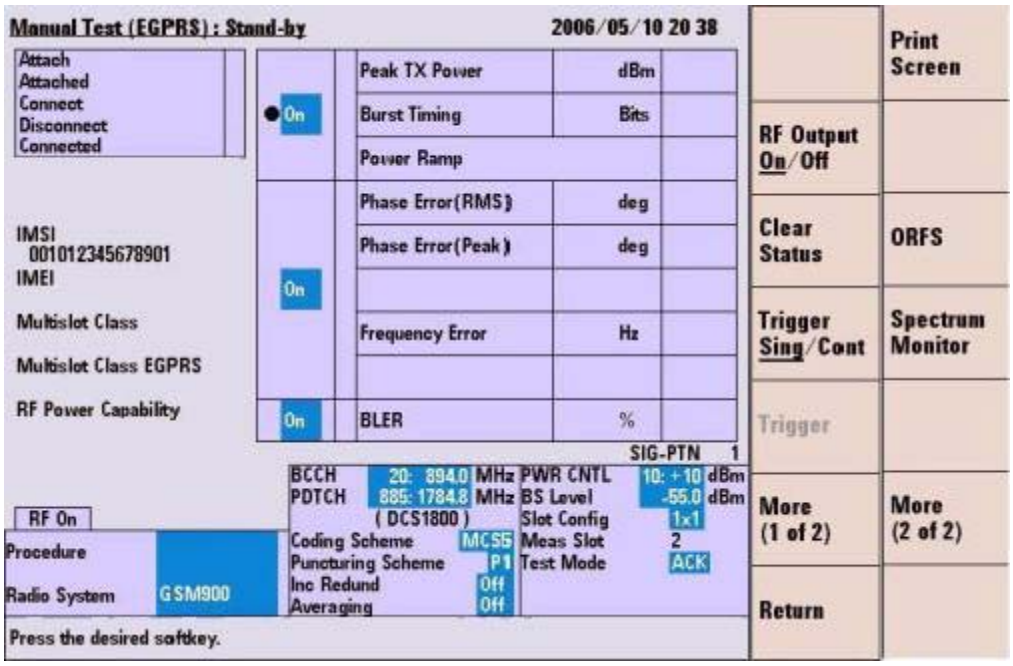
Step 6

Set appropriate test limits in the cells of the test items as shown in Figure 4-58. For testing BLER, set the upper limit value.

Step 7

Press the **Return**, **Return** again and then the **Manual Test** softkey to start Manual Test. The [Manual Test: Stand-by] screen as Figure 4-59 displayed.

Figure 4-59 [Manual Test: Stand-by] EGPRS Mode Screen



Step 8

Check the difference in the test flow, the parameters for slot configuration, and the **Sensitivity** field as compared to those for the Manual test GSM mode.

Step 9

Specify the input fields of the test parameters as shown in Figure 4-59.

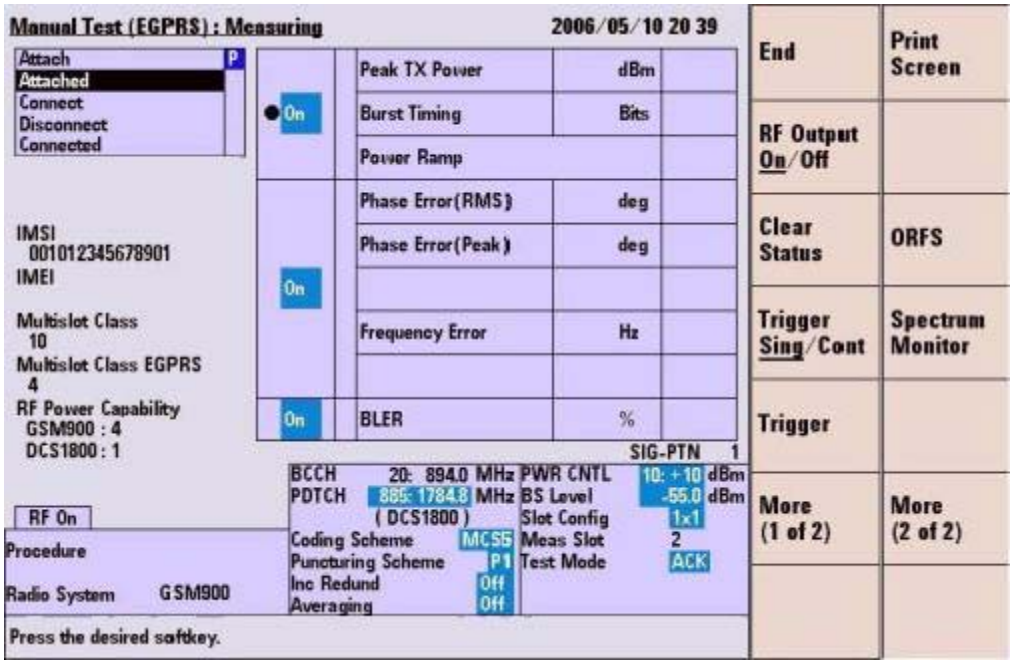
Step 10

Turn the mobile phone on and wait for it to camp on, and **P** is shown in the **Attach** step.

Step 11

Upon completion of the attaching process, the [Manual Test: Measuring] screen is displayed as shown in Figure 4-60.

Figure 4-60 [Measuring] Attached Screen (EGPRS Mode)



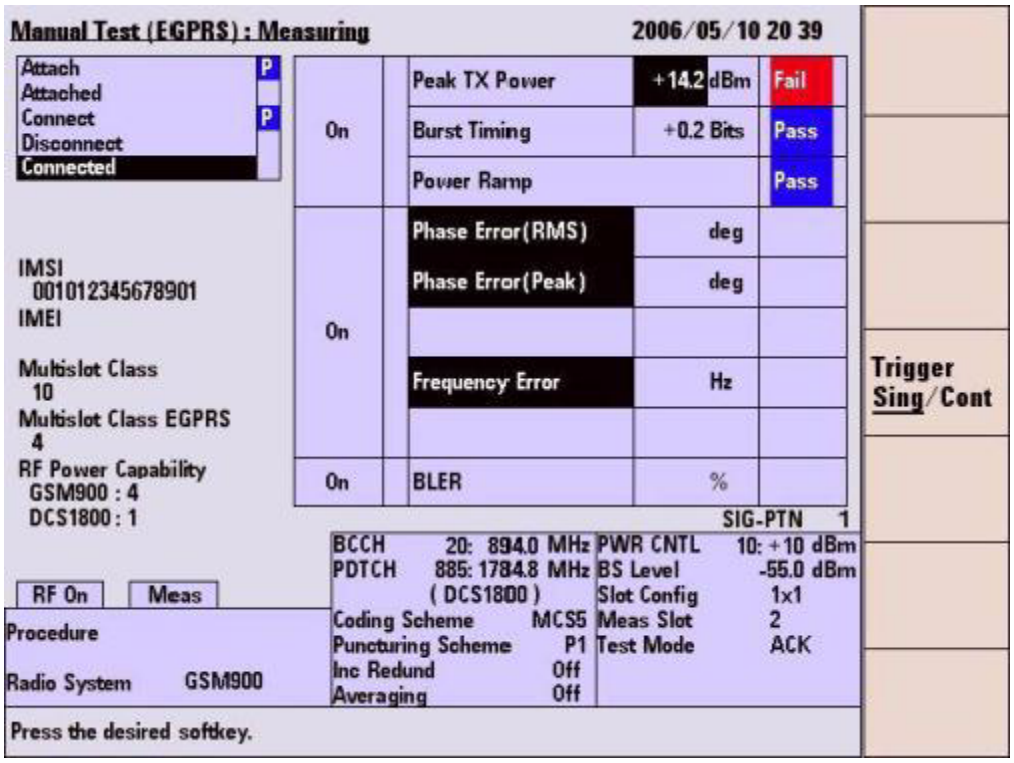
Step 12

When the attached process is succeeded, the Tester waits for the trigger.

- When the trigger mode is `Sing`, single measurement will start after the **Trigger** softkey is pressed.
- To change the trigger mode to `Cont` in order to start continuous measurement, press the **Trigger Sing/Cont** softkey.

  The [Manual Test: Measuring] connected screen is displayed as Figure 4-61.

Figure 4-61 [Measuring] Connected Screen (EGPRS Mode)



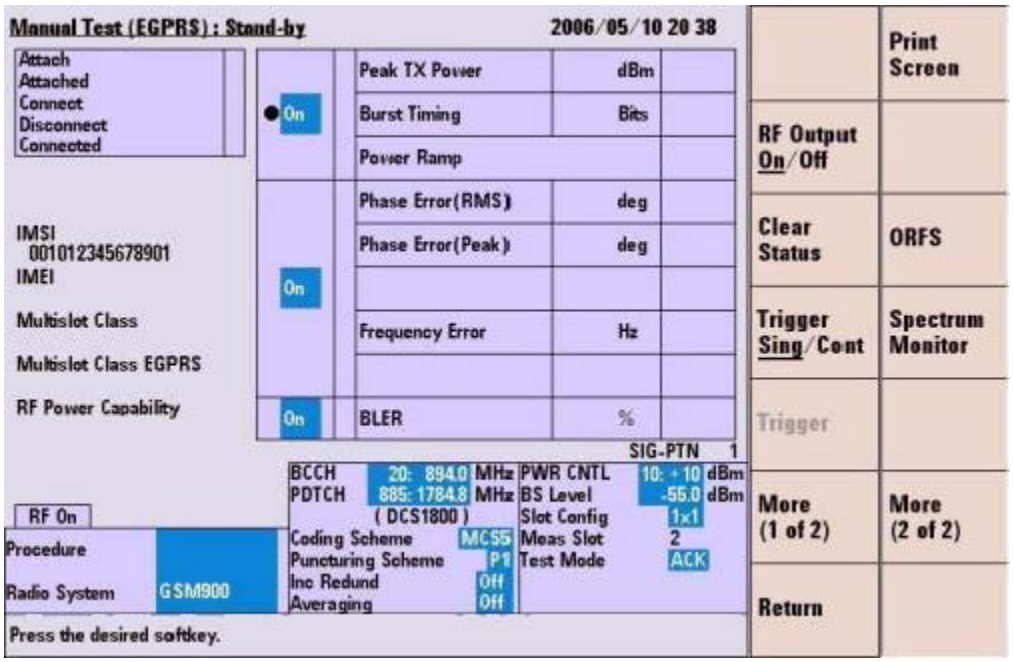
Step 13

During continuous measurement, change the trigger mode from `Cont` to `Sing` to terminate the measurement. Upon completion of the measurement at the **Connected** step, the step proceeds to the **Disconnect** step.

Step 14

The screen automatically changes to a [Measuring] summary screen containing test results.

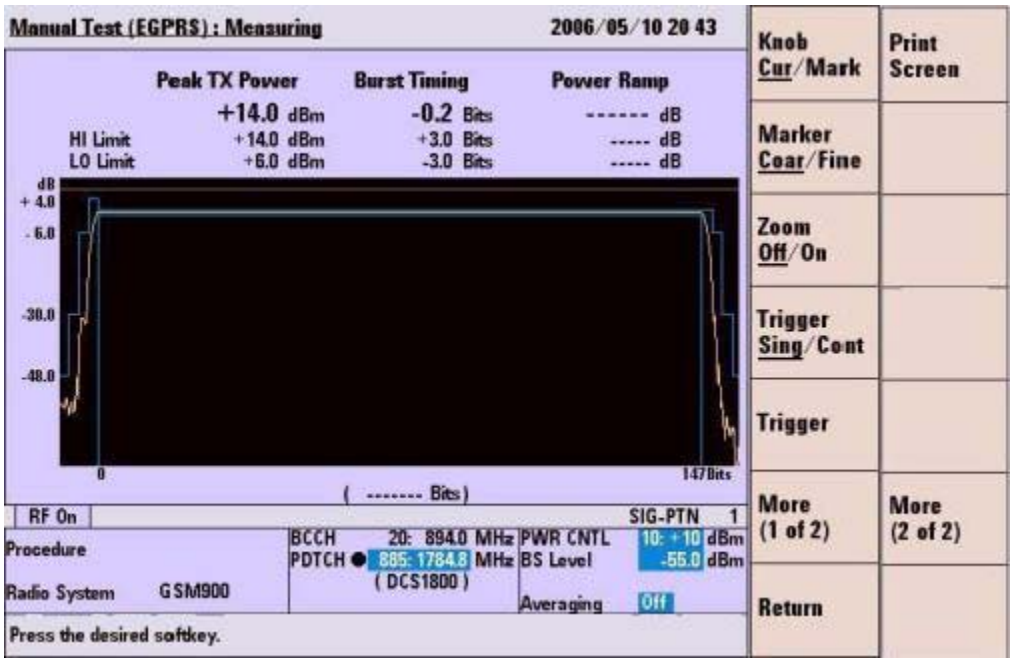
Figure 4-62 [Measuring] Summary Screen (EGPRS Mode)



Step 15

Select a group of measurement items with the CURSOR CONTROL knob to display the Graph/Value screen. Place the cursor at **Peak TX Power/Burst Timing/Power Ramp** and press the CURSOR CONTROL knob, for example, to display the Figure 4-63.

Figure 4-63 [Measuring] Graph/Value Screen (EGPRS Mode)



Step 16

Press a softkey as needed.

Knob Cur/Marker: Selects the cursor or the marker.

Marker Coar/Fine: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the amplitude and timeslot (in bits) is available at any point of the measurement trace.

Zoom Off/On: Selects the zoom mode from `On` and `Off`.

Trigger Sing/Cont: Selects the trigger mode from `Sing` to `Cont`.

- When the trigger mode is `Sing`, single measurement starts after the **Trigger** softkey is pressed.
- To change the trigger mode to `Cont` in order to start continuous measurement, press the **Trigger Sing/Cont** softkey.

Trigger: Starts single measurement when the trigger mode is set to `Sing`.

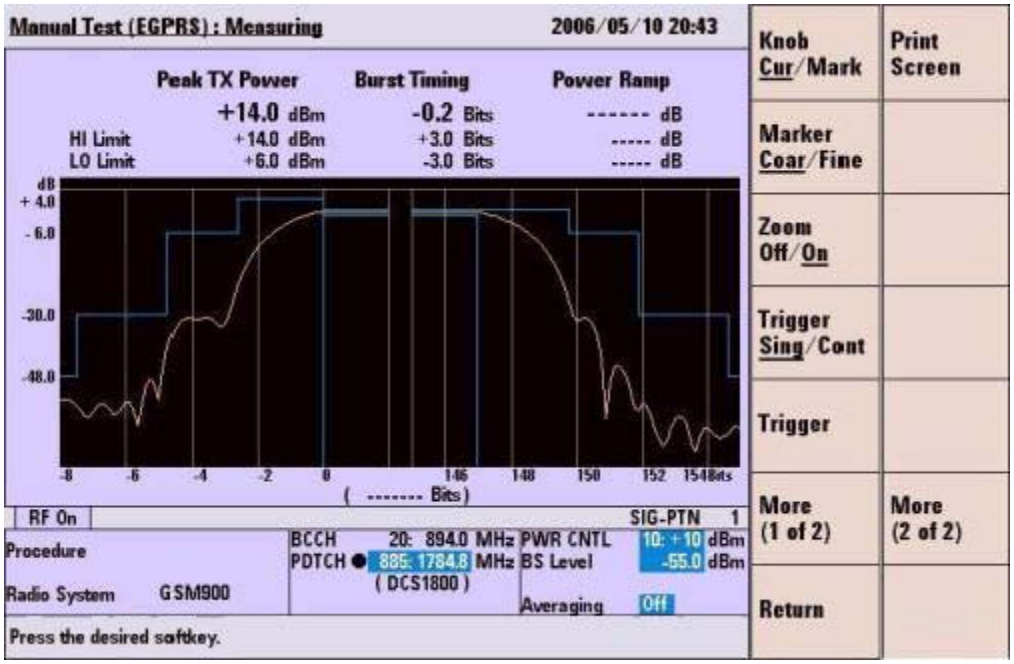
More (1 of 2): Displays the softkey menu 2.

Return: Returns to the previous screen.

Print Screen: Prints a hardcopy of the screen or saves it in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.

More (2 of 2): Returns to the softkey menu 1.

Figure 4-64 [Measuring] Graph/Value Zoomed Screen (EGPRS Mode)

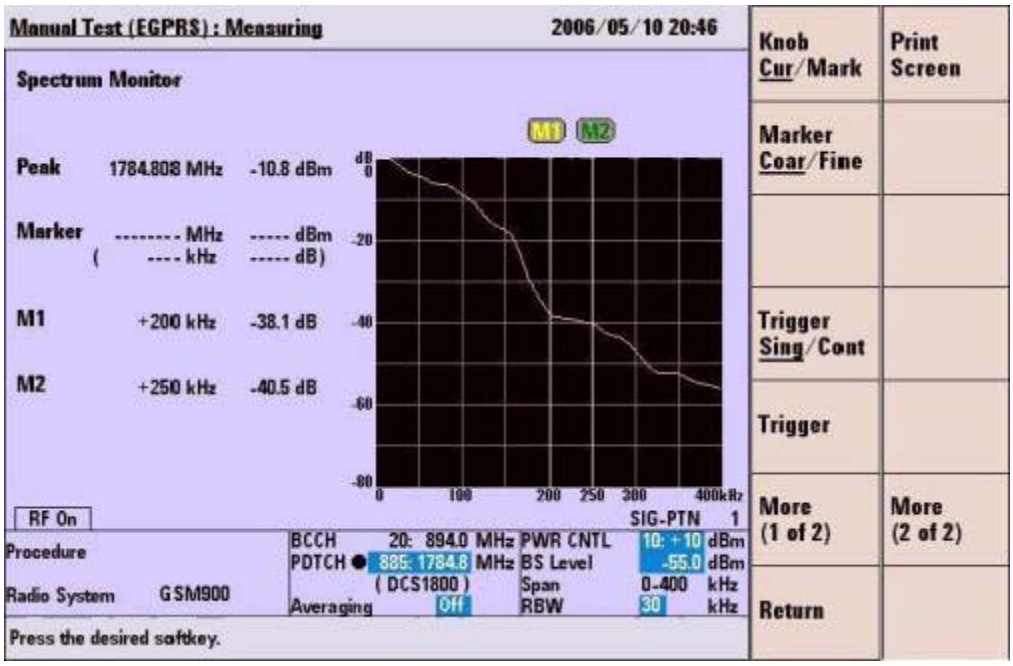


Press the **Return** softkey to return to the previous screen.

Step 17

Press the **More (1 of 2)** and the **Spectrum Monitor** softkey to display the Spectrum Monitor screen.

Figure 4-65 [Measuring] Spectrum Monitor Screen (EGPRS Mode)



Step 18

Press the **Trigger** softkey to measure spectrum in single mode, or the **Trigger Sing/Cont** softkey to measure the spectrum in continuous mode.

Step 19

Press the **Return** softkey to return to the previous screen.

Step 20

Press the **End** softkey to finish the test.

Testing a Mobile Phone by TX Analyzer

This section describes the operation method of the Tester for a test by the TX Analyzer.

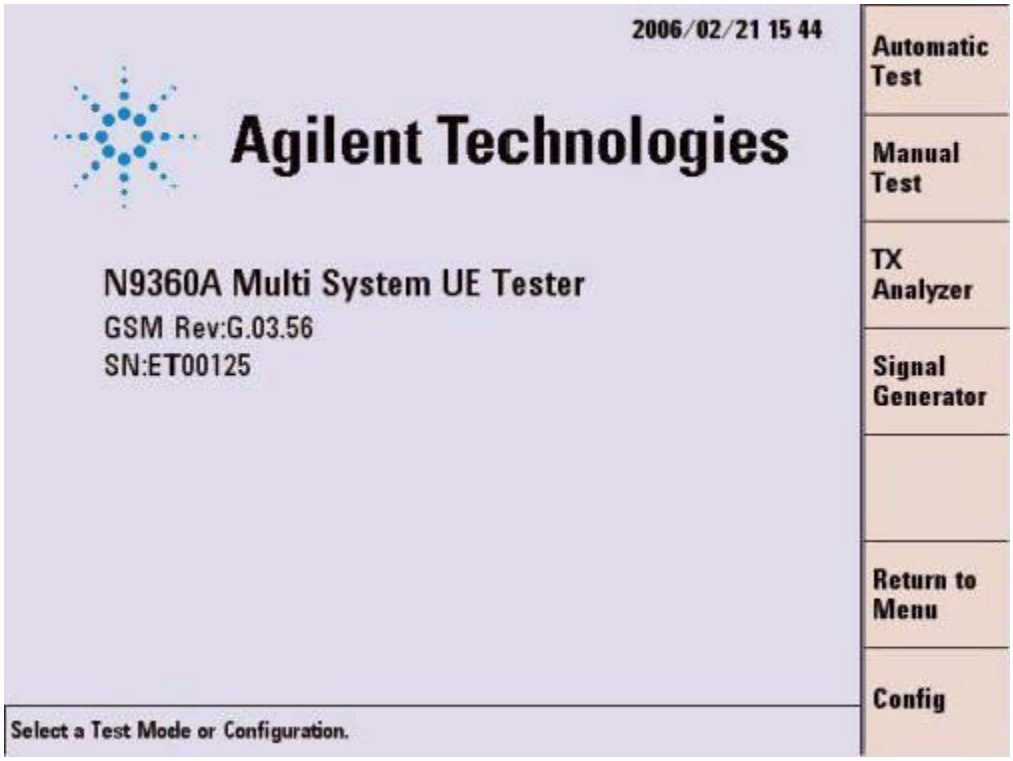
Step 1

Turn on the Tester and select the GSM system on the [Top Menu] screen. Refer to Selection of System on page 13 for selecting a system.

Step 2

The [Initial] screen as Figure 4-66 is displayed after completion of initialization and self-test routine of the Tester.

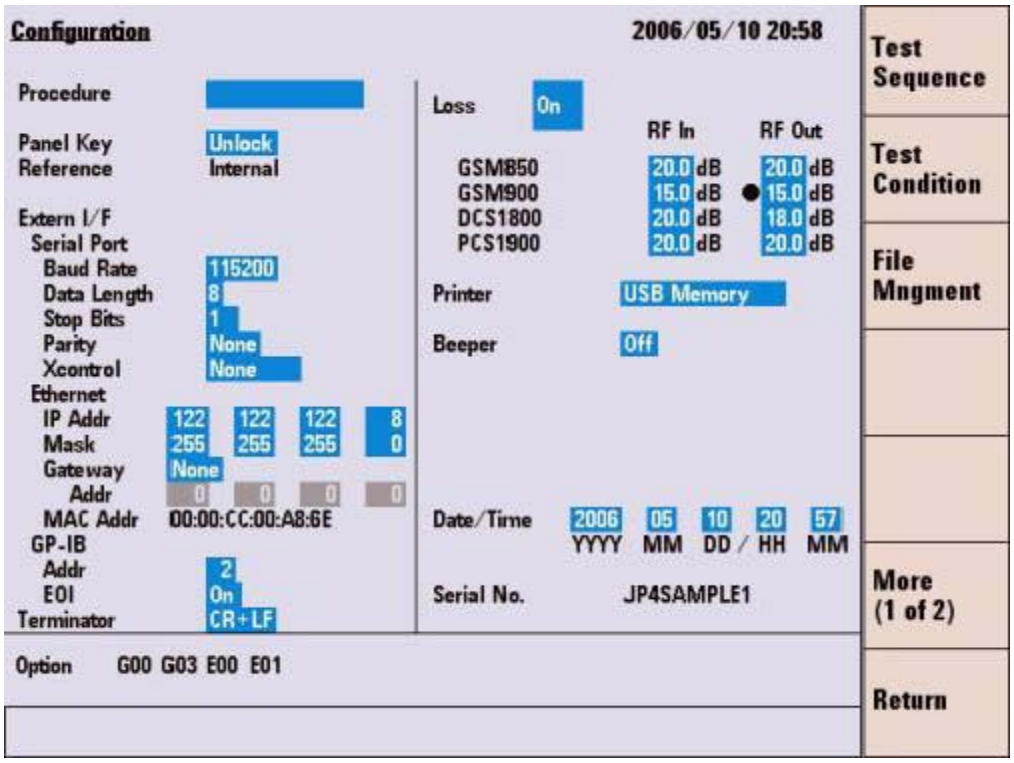
Figure 4-66 [Initial] Screen



Step 3

Press the **Config** softkey on the [Initial] screen to display the [Configuration] screen for specifying the **Loss** field.

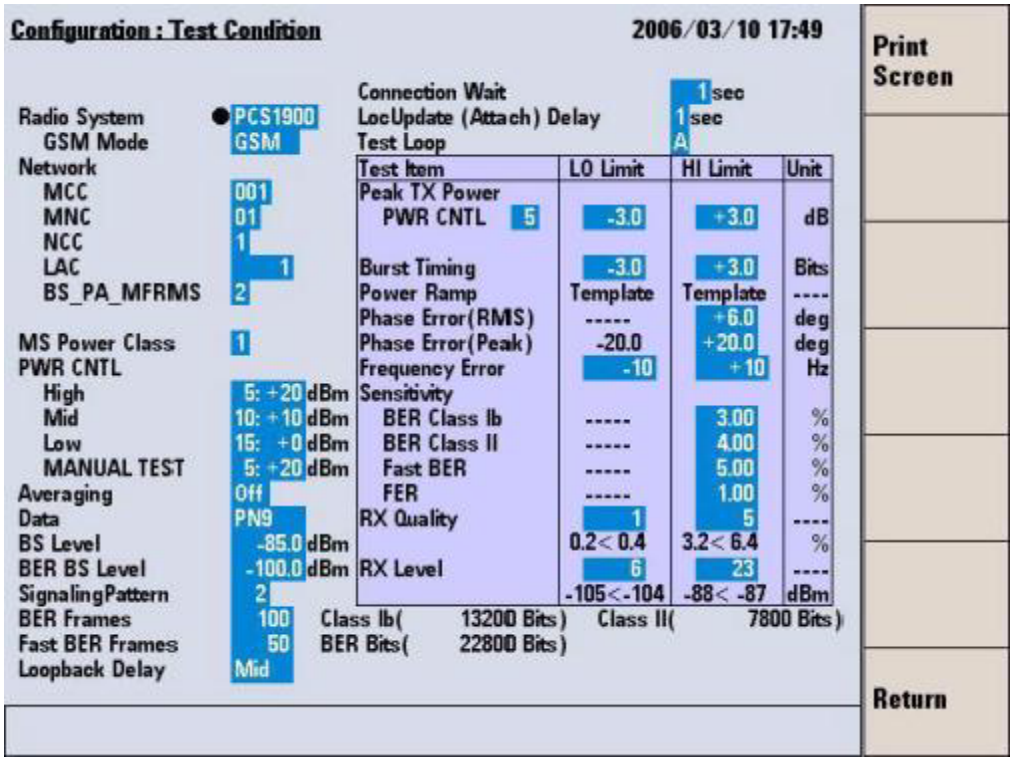
Figure 4-67 [Configuration] Screen



Step 4

Press the **Test Condition** softkey to display the [Configuration: Test Condition] screen to set the test condition.

Figure 4-68 [Configuration: Test Condition] Screen


Configuration : Test Condition
2006/03/10 17:49
Print Screen
Return
Connection Wait 1 sec
LocUpdate (Attach) Delay 1 sec
Test Loop A
Radio System PCS1900
GSM Mode GSM
Network
MCC 001
MNC 01
NCC 1
LAC 1
BS_PA_MFRMS 2
MS Power Class 1
PWR CNTL
High 5: +20 dBm
Mid 10: +10 dBm
Low 15: +0 dBm
MANUAL TEST 5: +20 dBm
Averaging Off
Data PN9
BS Level -85.0 dBm
BER BS Level -100.0 dBm
SignalingPattern 2
BER Frames 100
Fast BER Frames 50
Loopback Delay Mid
Test Item | LO Limit | HI Limit | Unit
Peak TX Power
PWR CNTL 5 | -3.0 | +3.0 | dB
Burst Timing | -3.0 | +3.0 | Bits
Power Ramp | Template | Template | ----
Phase Error(RMS) | ----- | +6.0 | deg
Phase Error(Peak) | -20.0 | +20.0 | deg
Frequency Error | -10 | +10 | Hz
Sensitivity
BER Class Ib | ----- | 3.00 | %
BER Class II | ----- | 4.00 | %
Fast BER | ----- | 5.00 | %
FER | ----- | 1.00 | %
RX Quality | 1 | 5 | ----
0.2< 0.4 | 3.2< 6.4 | %
RX Level | 6 | 23 | ----
-105<-104 | -88< -87 | dBm
Class Ib(13200 Bits) Class II(7800 Bits)
BER Bits(22800 Bits)

Step 5

Set the input fields of the test parameter as shown in Figure 4-68.

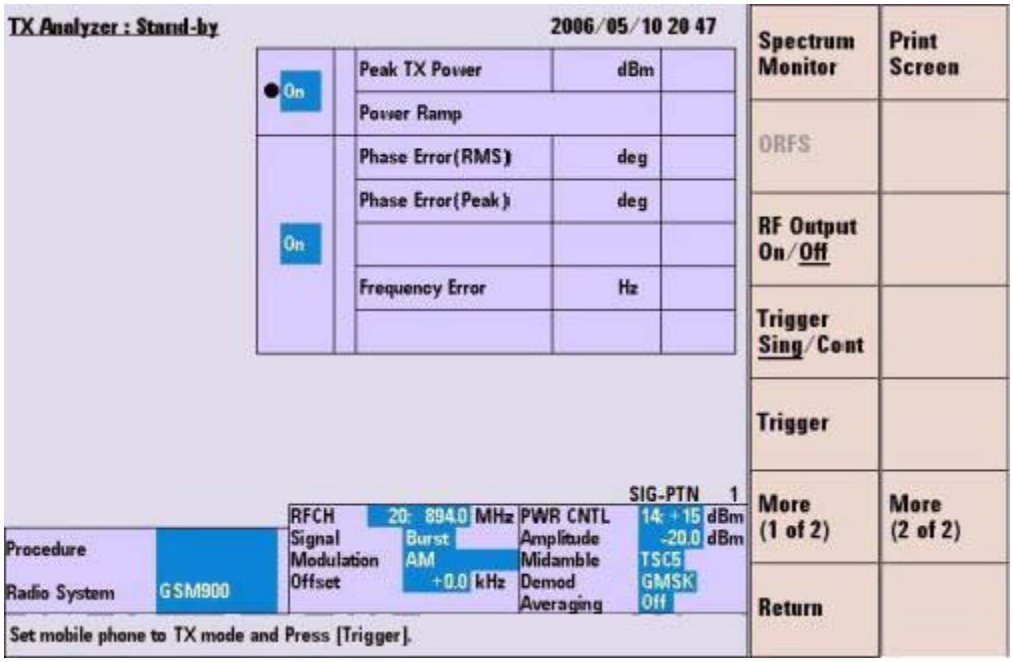
Step 6

Enter appropriate test limits in the cells of the test item table on the [Configuration: Test Condition] screen.

Step 7

Press the **Return** softkey twice and the **TX Analyzer** softkey to display the [TX Analyzer: Stand-by] screen.

Figure 4-69 [TX Analyzer: Stand-by] Screen



Step 8

Set the mobile phone to transmit the bursted RF signal.

Step 9

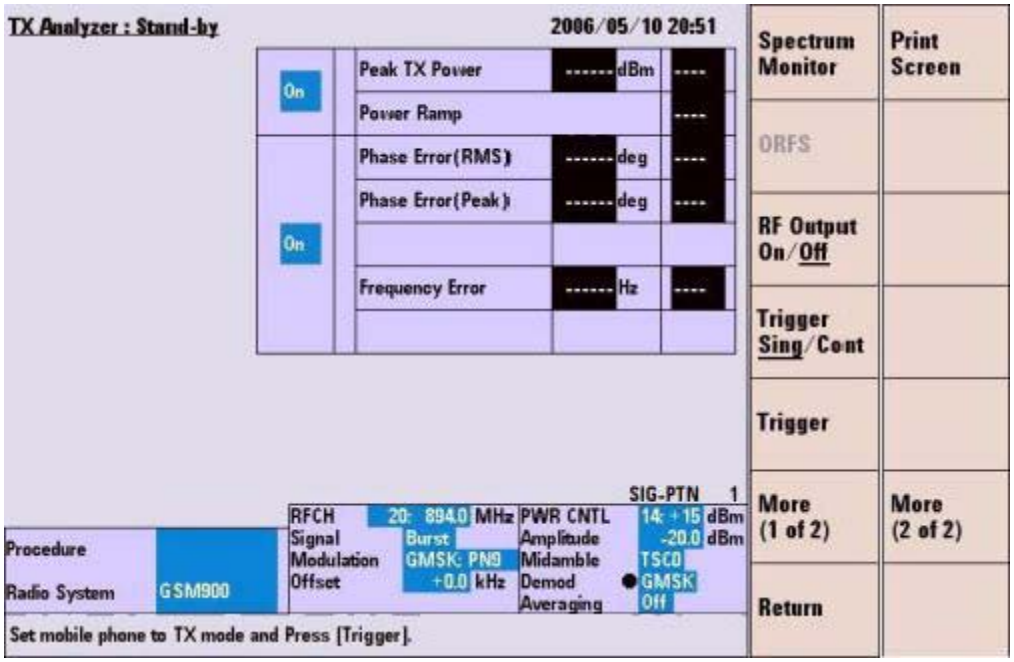
Start a test with the following softkey operation.

- **Trigger Sing/Cont**: When the trigger mode is `Sing`, single measurement will start after the **Trigger** softkey is pressed. To change the trigger mode to `Cont` in order to start continuous measurement, press the **Trigger Sing/Cont** softkey. When the trigger mode is `Cont`, continuous measurement starts as soon as the [TX Analyzer: Stand-by] screen is displayed.
- **Trigger**: Starts single measurement.

Step 10

During continuous measurement, press the **Trigger Sing/Cont** softkey to terminate continuous measurement. A summary screen showing measurement result is displayed.

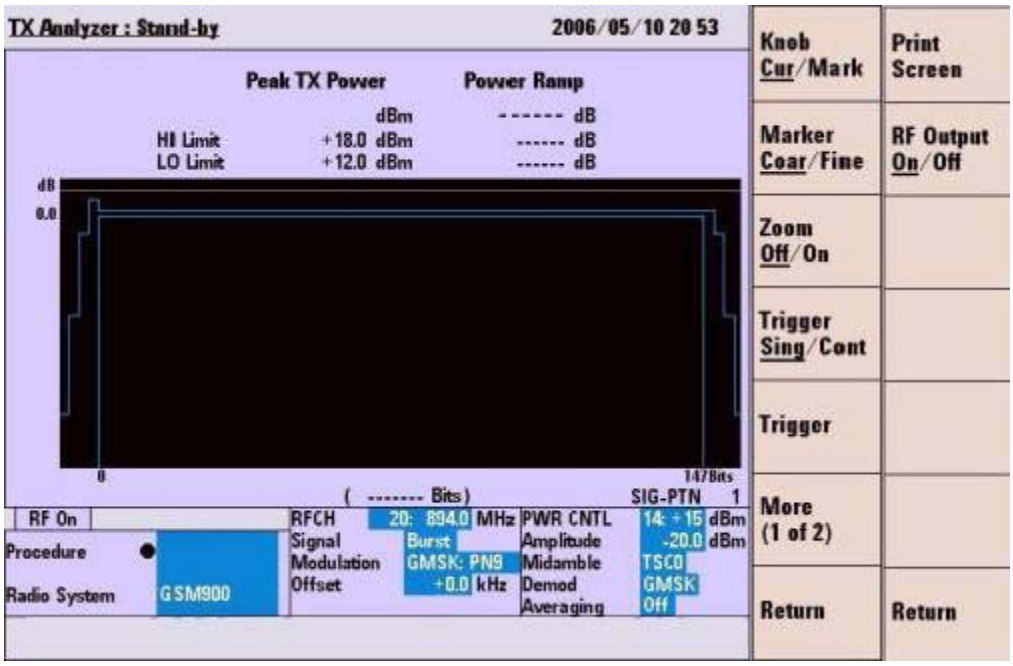
Figure 4-70 [Stand-by] Summary Screen



Step 11

Select a group of measurement items with the CURSOR CONTROL knob to display the Graph/Value screen. Place the cursor at **Peak TX Power/Burst Timing/Power Ramp** and press the CURSOR CONTROL knob, for example, to display Figure 4-71.

Figure 4-71 [Stand-by] Graph/Value Screen



Step 12

Press a softkey as needed.

Knob Cur/Marker: Selects the cursor or the marker.

Marker Coar/Fine: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the amplitude and timeslot (in bits) is available at any point of the measurement trace.

Zoom Off/On: Selects the zoom mode from `On` and `Off`.

Trigger Sing/Cont: Selects the trigger mode from `Sing` to `Cont`.

- When the trigger mode is `Sing`, single measurement starts after the **Trigger** softkey is pressed.
- To change the trigger mode to `Cont` in order to start continuous measurement, press the **Trigger Sing/Cont** softkey.

Trigger: Starts single measurement when the trigger mode is set to `Sing`.

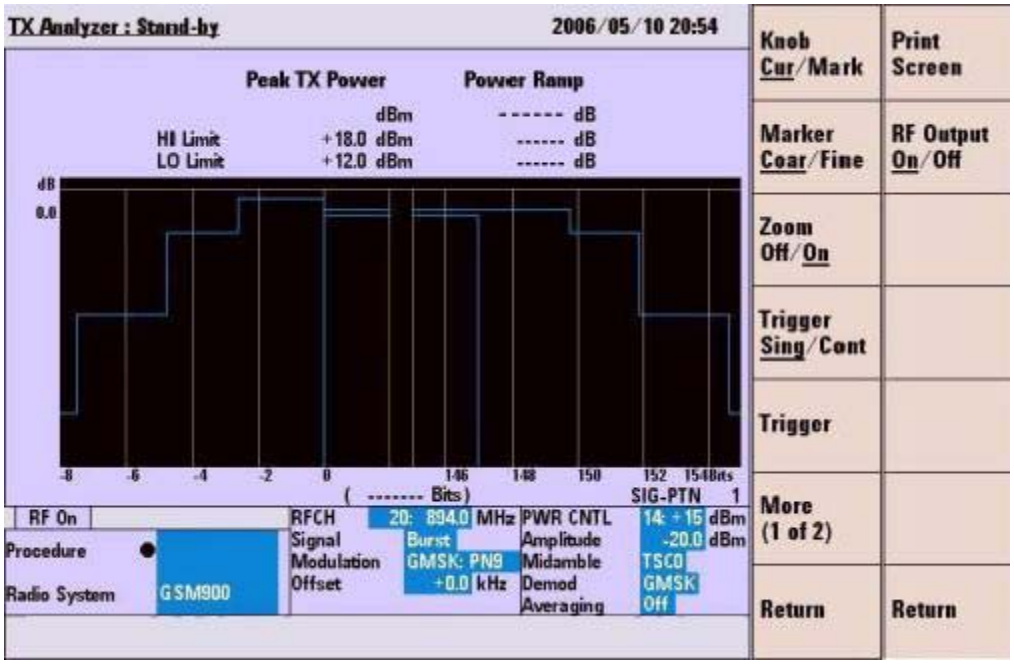
More (1 of 2): Displays the softkey menu 2.

Return: Returns to the previous screen.

Print Screen: Prints a hardcopy of the screen or saves it in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.

More (2 of 2): Returns to the softkey menu 1.

Figure 4-72 [Stand-by] Graph/Value Zoom Screen

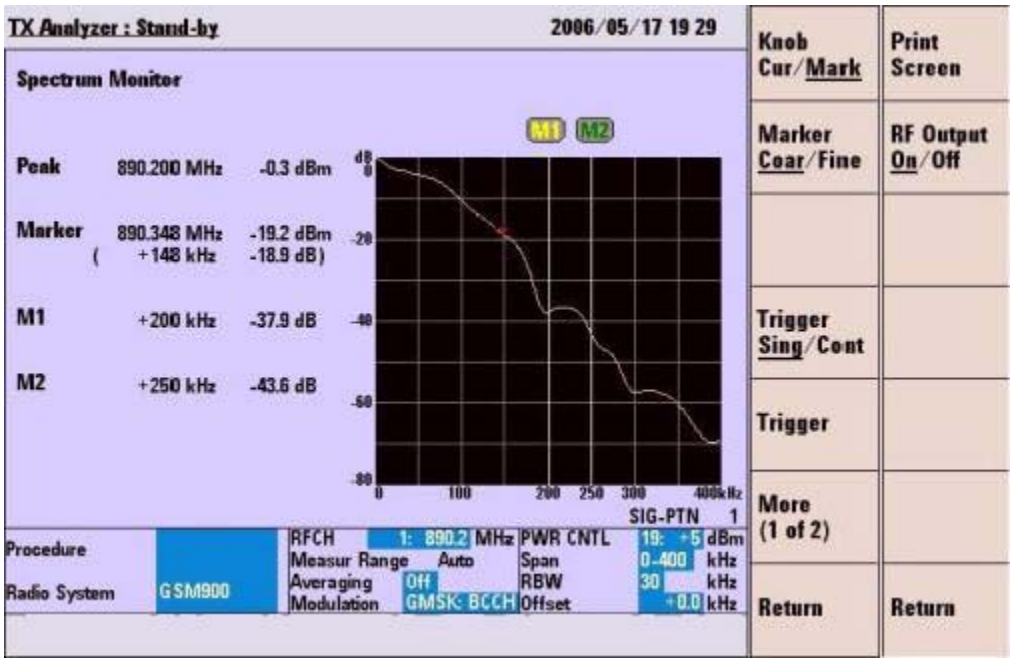


Press the **Return** softkey to return to the previous screen.

Step 13

Press the **More (1 of 2)** and the **Spectrum Monitor** softkey to display the Spectrum Monitor screen.

Figure 4-73 [Stand-by] Spectrum Monitor Screen



Step 14

Press the **Trigger** softkey to measure spectrum in single mode, or the **Trigger Sing/Cont** softkey to measure the spectrum in continuous mode.

Step 15

Press the **Return** softkey to return to the previous screen.

Testing a Mobile Phone by Signal Generator

This section describes the operation method of the Tester for a test by the Signal Generator.

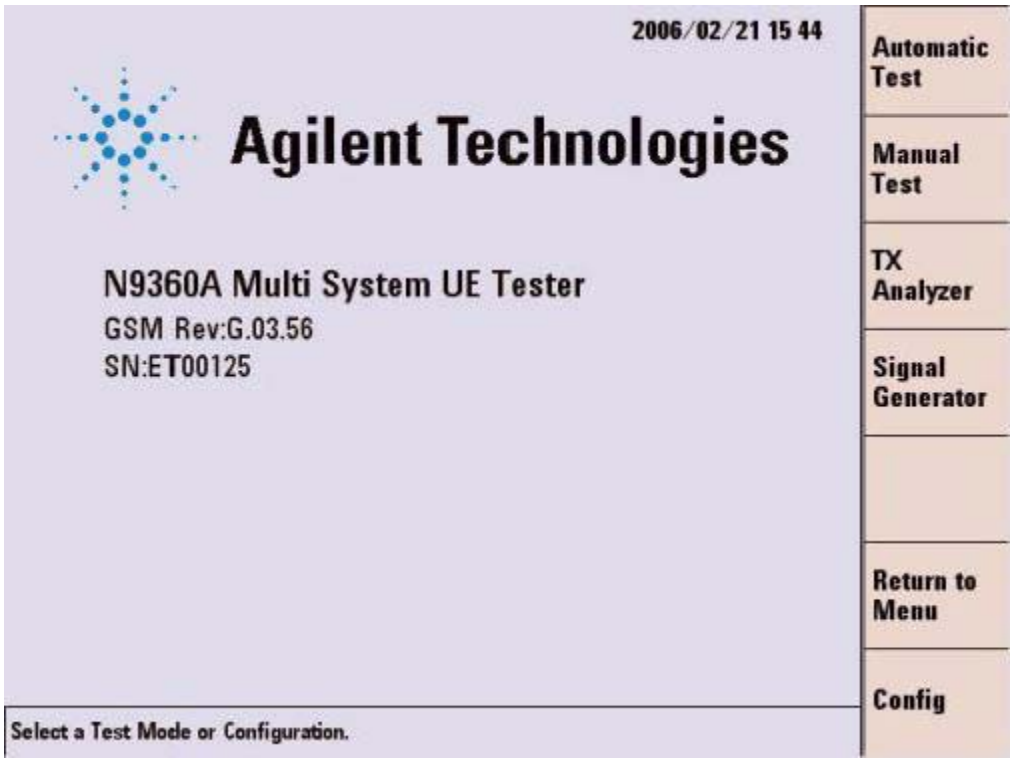
Step 1

Turn on the Tester and select the GSM system on the [Top Menu] screen. Refer to Selection of System on page 13 for selecting a system.

Step 2

The [Initial] screen as Figure 4-74 is displayed after completion of initialization and self-test routine of the Tester.

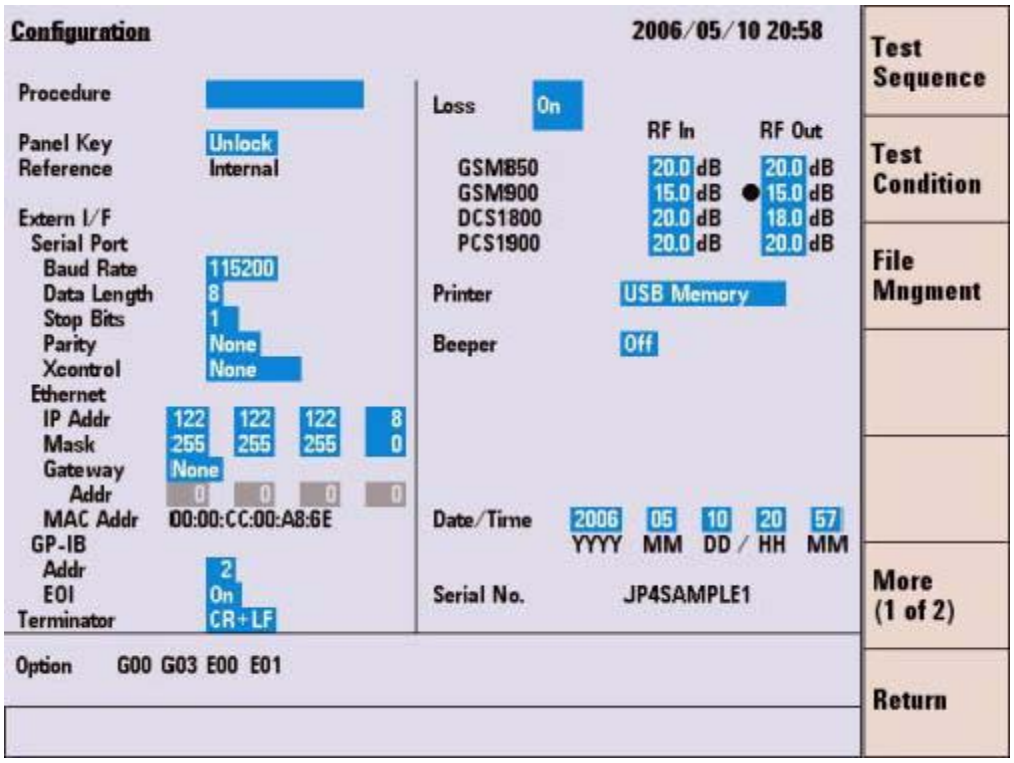
Figure 4-74 [Initial] Screen



Step 3

Press the **Config** softkey on the [Initial] screen to display the [Configuration] screen for specifying the **Loss** field.

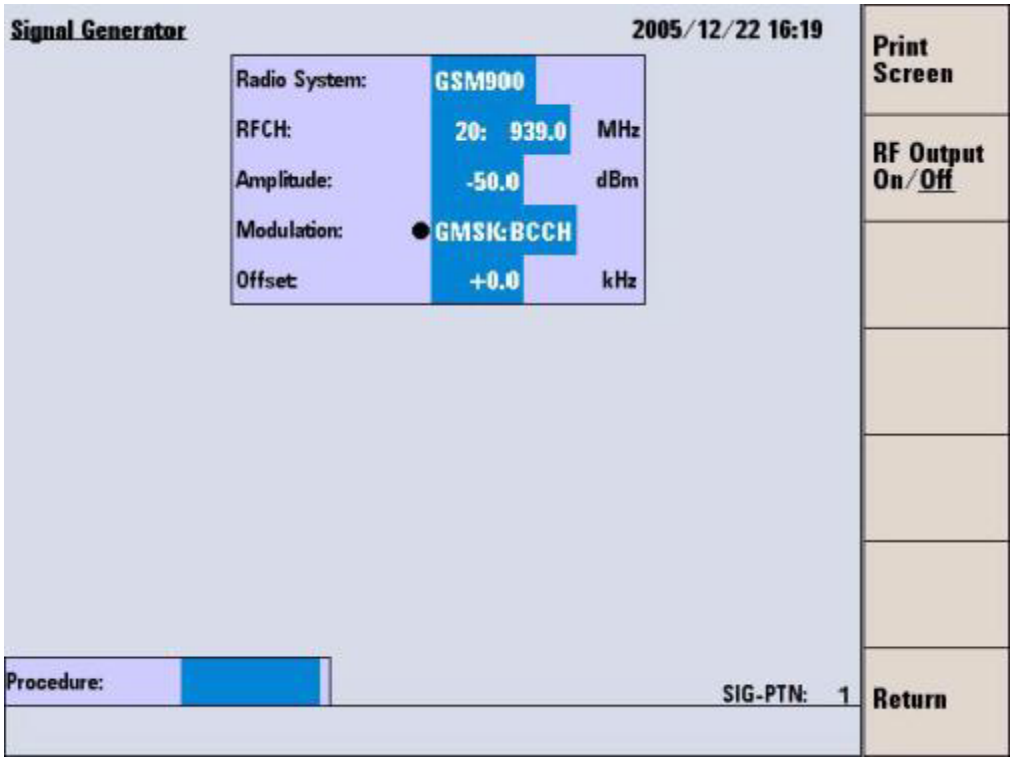
Figure 4-75 [Configuration] Screen



Step 4

Press the **Return** and then the **Signal Generator** softkey on the [Initial] screen. The [Signal Generator] screen as Figure 4-76 is displayed.

Figure 4-76 [Signal Generator] Screen



Step 5

Set the input fields.

Step 6

Press the **RF Output On/Off** softkey to change **On/Off** state from `Off` to `On` for transmitting RF signal to the mobile phone.

Step 7

Press the **RF Output On/Off** softkey again to change **On/Off** state from `On` to `Off` for ending the test.

Ending a Test

CAUTION Do not turn off the Line switch on the rear panel of the Tester while the LINE LED on the front panel of the Tester is lit in green. Otherwise, Tester failure may occur.

Disconnecting the Mobile Phone

Disconnect the mobile phone from the connection cable or the antenna coupler.

Remove the Test SIM card from the mobile phone.

Operation after End of a Test

Turning off the Tester

Turn off the Tester with the following procedure:

Step 1

Press the LINE switch on the front panel of the Tester for more than one second.

Step 2

The display blacks out, and the LINE LED on the front panel is lit in orange.

Step 3

The power is turned off except the reference oscillator in the Tester.

Step 4

Turn off the Line switch on the rear panel of the Tester to turn off the reference oscillator.

Step 5

Every power including the reference oscillator is turned off and the LINE LED goes off.

THIS PAGE IS INTENTIONALLY LEFT BLANK

5
Screen Reference

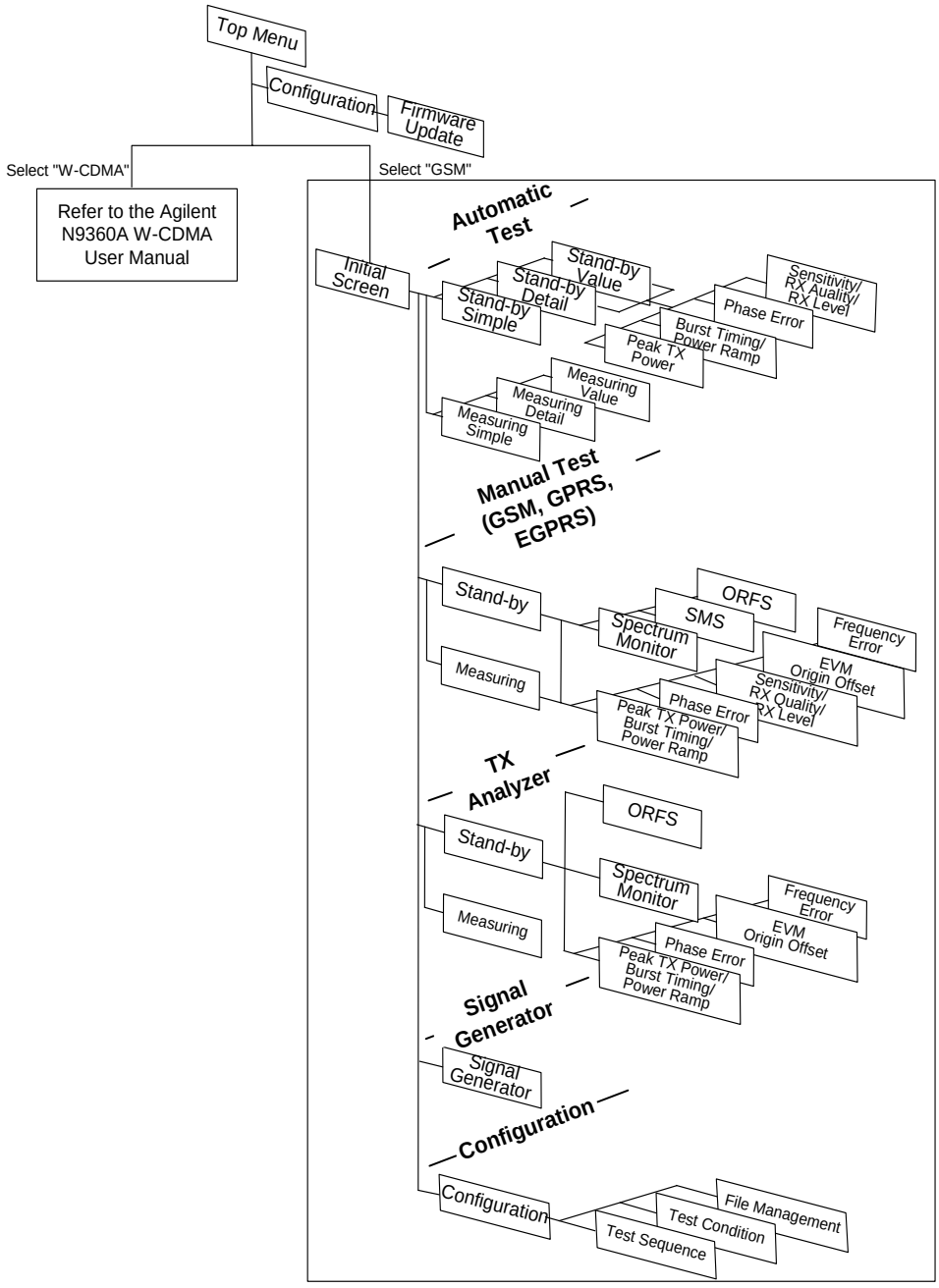
Screen Flow Chart 5-2
Top Menu Screen 5-3
Firmware Update Screen 5-10
Initial Screen 5-12
Return to Menu Screen 5-15
Automatic Test 5-16
Manual Test (GSM Mode) 5-45
Manual Test (GPRS Mode) 5-78
Manual Test (EGPRS Mode) 5-104
TX Analyzer 5-137
Signal Generator 5-166
Configuration 5-168
Configuration: Test Condition Screen 5-176

In this chapter, each screen of the Tester is explained in detail including the operational features and the functional softkeys activated in each screen.

Screen Flow Chart

The following Figure 5-1 shows the screen flow chart for each function mode. Each rectangle represents one screen with a different function mode, measuring step and status, measurement results and so forth.

Figure 5-1 Screen Flow Chart



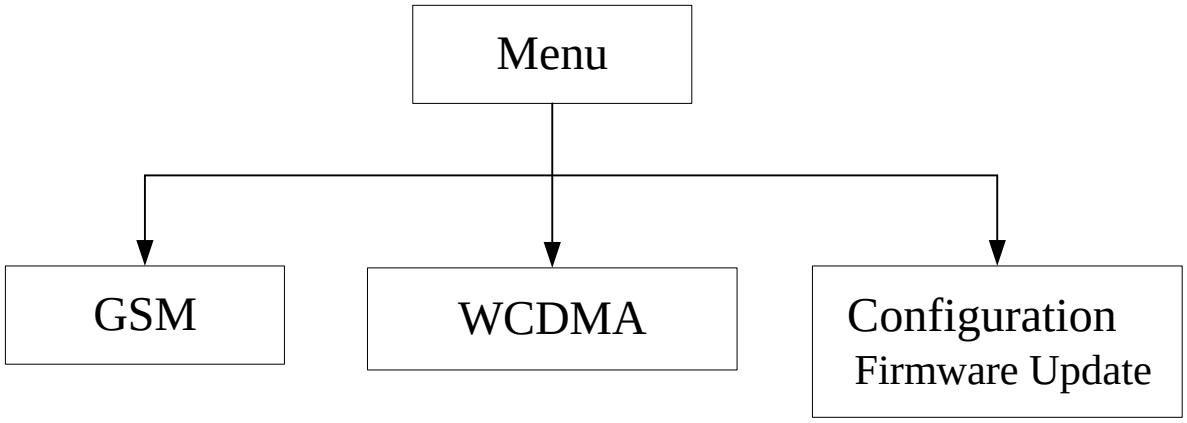
Top Menu Screen

After power on, the [Top Menu] screen as Figure 5-2 is displayed.

This screen is used to select a system or the [Configuration] screen.

The system options are GSM and W-CDMA.

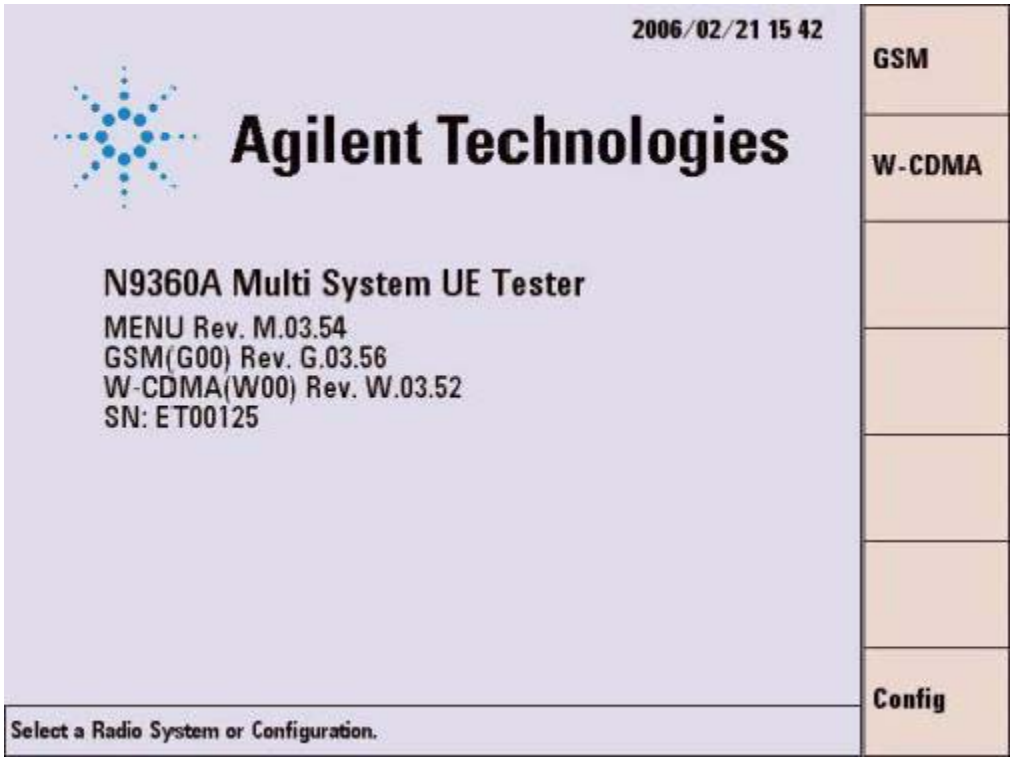
Figure 5-2 Selectable Systems



NOTE

This *N9360A GSM User Manual* describes only the GSM system. Refer to the *N9360A W-CDMA User Manual* about the W-CDMA system.

Figure 5-3 [Top Menu] Screen



Softkey Menu Field

Softkey Menu

- **GSM**: Selects the GSM system. After the system is selected, the Tester is automatically rebooted, and then displays the [Initial] screen for GSM system. This softkey is activated when the GSM system is installed in the Tester.
- **WCDMA**: Selects the W-CDMA system. After the system is selected, the Tester is automatically rebooted, and then displays the [Initial] screen for W-CDMA system. This softkey is activated when the W-CDMA system is installed in the Tester.
- **Configuration**: Displays the [Configuration] screen.

NOTE

When the Autoboot function is set to GSM or WCDMA and not to None, the Tester will automatically enter the GSM or W-CDMA system mode, if no softkey is pressed within the specified time (10 to 60 seconds). When the Tester is shipped, the AutoBoot function is set to None. For details, see AutoBoot on page 8.

Screen Field

The firmware name, revision number currently installed, and serial number are shown.

Message Field

The following message is displayed in the message field:

Select a Radio System or Configuration.

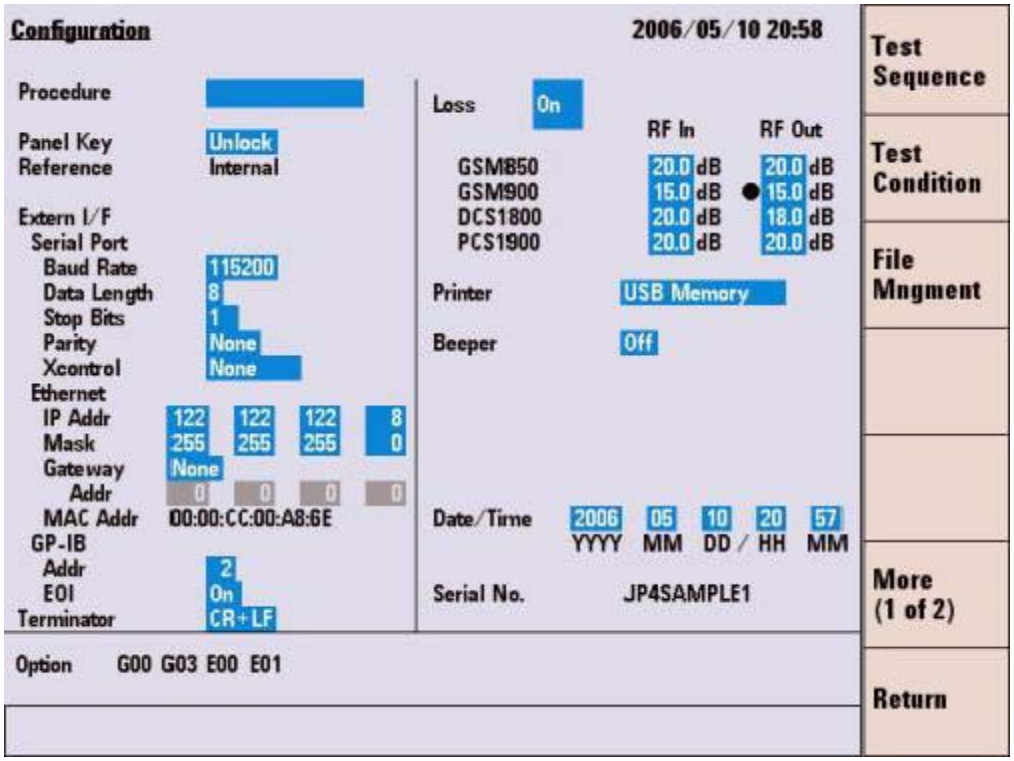
Configuration Screen

When the **Config** softkey is pressed on the [Top Menu] screen, the [Configuration] screen as Figure 5-4 is displayed.

The following various conditions are set on this screen.

- Reference signal internal/external changing
- External control relevant to I/F
- Date and Time
- Printer
- Key confirmation beep
- AutoBoot

Figure 5-4 [Configuration] Screen



Softkey Menu Field

Softkey Menu

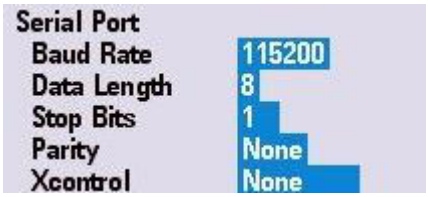
- **Print Screen**: Prints a hardcopy of the screen or saves it in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **FW Update**: Displays the [Firmware Update] screen.
- **Option Install**: Used for installation of an option function such as GSM and W-CDMA.
- **Option Backup**: Used for backup of options in effect.
- **Return**: Returns to the [Top Menu] screen.

When the Option E00 is not installed in the Tester, the **GP-IB** field is displayed in gray (inactivated) as shown in Figure 5-5.

Figure 5-5 Part of [Configuration] screen (without Option E00)

When the Option E01 is not installed in the Tester, the **Serial Port GP-IB** field is displayed in gray (inactivated) as Figure 5-6.

Figure 5-6 Part of [Configuration] screen (without Option E01)



Screen Field

The following input fields need to be set to use the Tester according to the following description of Table 5-1.

Table 5-1 [Configuration] Screen Input Field

Input Field	Description
Reference	Selects the reference signal from **Internal** and **External**. • Internal: Use the internal 10 MHz reference signal. • External: Use the external 10 MHz reference signal. The 10 MHz reference signal must be supplied to the 10MHz Reference IN connector on the rear panel.
Serial Port	Sets the serial (RS-232C) port communication condition to use external control. This function is unavailable without E00/E01 option. • Baud Rate: Sets communication speed to `9600`, `19200`, `38400`, `57600` or `115200` bits per second. • Data Length: Sets data length to `7` or `8` bits. • Stop Bits: Sets stop bit length to `1`, `1.5` or `2` bits. • Parity: Sets parity check mode to `None`, `Odd` or `Even`. • Xcontrol: Sets flow control to `None` or `Xon/Xoff`.
Ethernet *	• IP Addr.: Sets IP Address. The allowable range is from `0.0.0.0` to `255.255.255.255`. • Mask: Sets Subnet mask. The allowable range is from `0.0.0.0` to `255.255.255.255`. Reboot the Tester after changing Ethernet setting.

Table 5-1 [Configuration] Screen Input Field

Input Field	Description

GP-IB *	Sets GP-IB. This function is unavailable without E00/E01 option.
	• Address: Sets the address. The allowable range is from 1 to 15.
	• EOI: Sets EOI control. Select On or Off.
	  • On: Enables EOI control. (Terminate character is invalid).
	  • Off: Disables EOI control. (Terminate character is valid).
	Reboot the Tester after changing GP-IB setting.

Terminator	Sets a terminator of output text data to CR, LF or CR+LF. This setting is used for remote control with Serial, Ethernet and GP-IB. (The Terminator of input text data is always LF)
Date/ Time *	Sets the current date and time in the following formats: • YYYY: Sets the year. The allowable range is from 1990 to 2037. • MM: Sets the month. The allowable range is from 01 to 12. • DD: Sets the day. The allowable range is from 01 to 31. • HH: Sets the hour. The allowable range is from 00 to 23. • MM: Sets the minute. The allowable range is from 00 to 59.
Printer	Sets the output direction of print screen to USB Memory or EPSON PM-G800. • USB Memory: Saves a graphic file of screen in a USB memory device. The image format is PNG. • EPSON PM-G800: Prints a hardcopy of screen in the specified printer.
Beeper	Sets beep. Selects On or Off. • On: Beeps for each step of operation. • Off: Beeps only for noticing some errors and warnings.

AutoBoot	Selects the system booted specified time after the [Top Menu] screen is displayed.
	• Application: Sets the system from the followings
	  • None: Not automatically boots
	  • GSM: Boots the GSM option
	  • WCDMA: Boots the W-CDMA option
	• Timer: Sets the timeout from 10 to 60 seconds, or -. The timer is stopped if any softkey is pressed.
	  • —: Invalid when **Application** is set to None.
	  • 10 to 60: Specifies timeout when **Application** is set to GSM or WCDMA.

* The changing magnification softkey is available. Refer to Changing Magnification Softkey on page 13.

Also, the following information is shown in the screen field:

- MAC Address
- Serial No.
- Option: Displays options in numerical orders. This field remains blank when no option is installed in the Tester.

Option Installation/Backup

Installation/Backup of options such as G00 and W00 can be controlled on the [Configuration] screen.

NOTE

To install options, the option key suitable for required option is necessary. For further information, contact the Agilent Sales Department or an authorized distributor.

Option Installation

Before the installing options, prepare the USB memory device containing a suitable Option Key.

Step 1

Press the **Config** softkey on the [Top menu] screen to display [Configuration] screen of the Figure 5-4.

Step 2

Insert USB memory device containing the Option Key into the USB connector on the front panel of the Tester.

Step 3

Press the **Option Install** softkey.

Step 4

Confirm an option number is added on the **Option** field of the screen, and remove the memory device from the tester.

Option Backup

Prepare the USB memory device containing a suitable Option Key to backup the option.

Step 1

Press the **Config** softkey on the [Top menu] screen to display [Configuration] screen of the Figure 5-4.

Step 2

Insert USB memory device containing the Option Key into the USB connector on the front panel of the Tester.

Step 3

Press the **Option Backup** softkey.

Step 4

Confirm **Option Backup complete!** is appeared on the **Message** field of the screen, and remove the memory device from the tester.

Firmware Update Screen

Insert the USB memory device which stores the firmware in the USB connector on the front panel of the Tester.

Press the **FW Update** softkey on the [Configuration] screen obtained from the [Top Menu] screen to display the [Firmware Update] screen as Figure 5-7.

The following information is displayed on this screen:

- **Revision**:

  The current revision and revision of the firmware stored in the USB memory device are displayed.

- **?.??.??:**

  This is displayed if there is no file for firmware update.

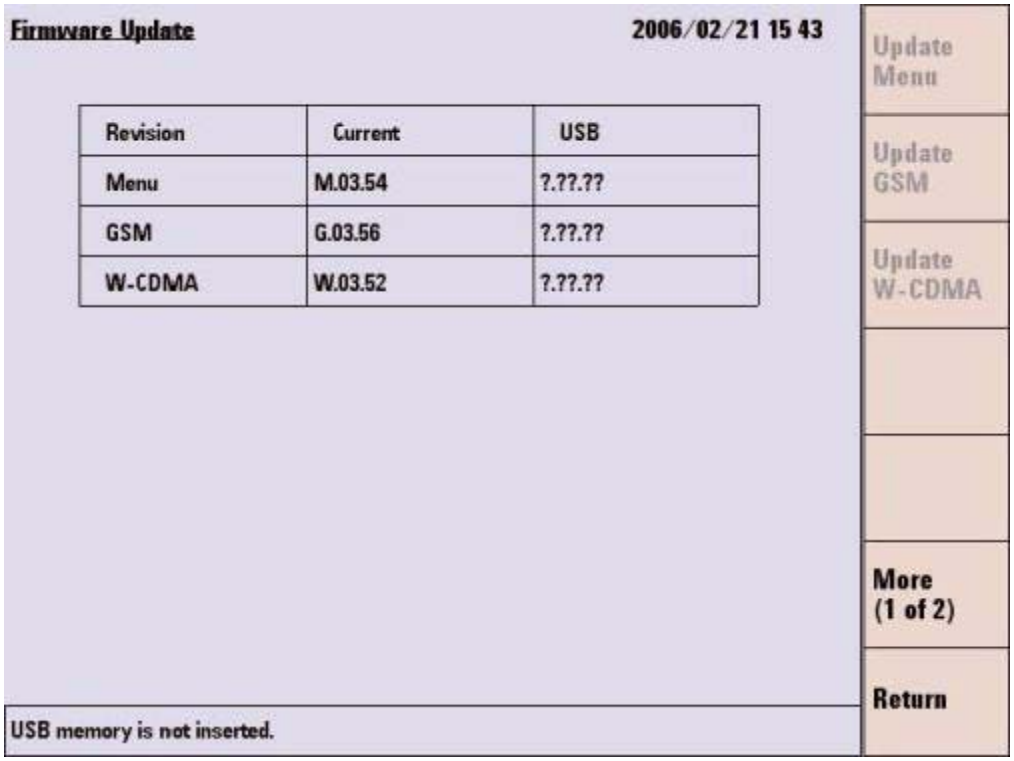
- **-.--.--:**

  This is displayed as a version number for an uninstalled option. Also, the uninstalled option is displayed in white.

- **(complete):**

  This is displayed for the USB version which is updated successfully.

Figure 5-7 [Firmware Update] Screen



Softkey Menu Field

Softkey Menu 1

- **Update Menu**: Updates the Menu function.

  This softkey is activated when this screen is selected while the USB memory device containing the firmware of Menu function is inserted. Reboot the Tester after updating the Menu function.

- **Update GSM**: Updates GSM function.

  This softkey is activated when this screen is selected while the USB memory device containing the firmware of GSM function is inserted.

- **Update WCDMA**: Updates WCDMA function.

  This softkey is activated when this screen is selected while the USB memory device containing the firmware of WCDMA function is inserted.

- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Configuration] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Update SYSTEM**: Updates system. This softkey is activated when this screen is selected while the USB memory device containing the system renewal is inserted. Reboot is required depending on the content of update after update of the system renewal.
- **More (2 of 2)**: Returns to the softkey menu 1.

Message Field

The following messages are displayed depending on the state:

- **Press [Update xxxx] to update. (This message is displayed if any firmware exists in the USB memory.)**
- **USB memory is not inserted.**
- **No update file exists in the inserted USB memory device.**
- **Processing... [Don't remove a USB memory!]**
- **Completed!**
- **FW-Update failed [Error number]**

NOTE

Before pressing the **FW Update** softkey, be sure that the proper USB memory device for firmware update is inserted in the USB connector.

Initial Screen

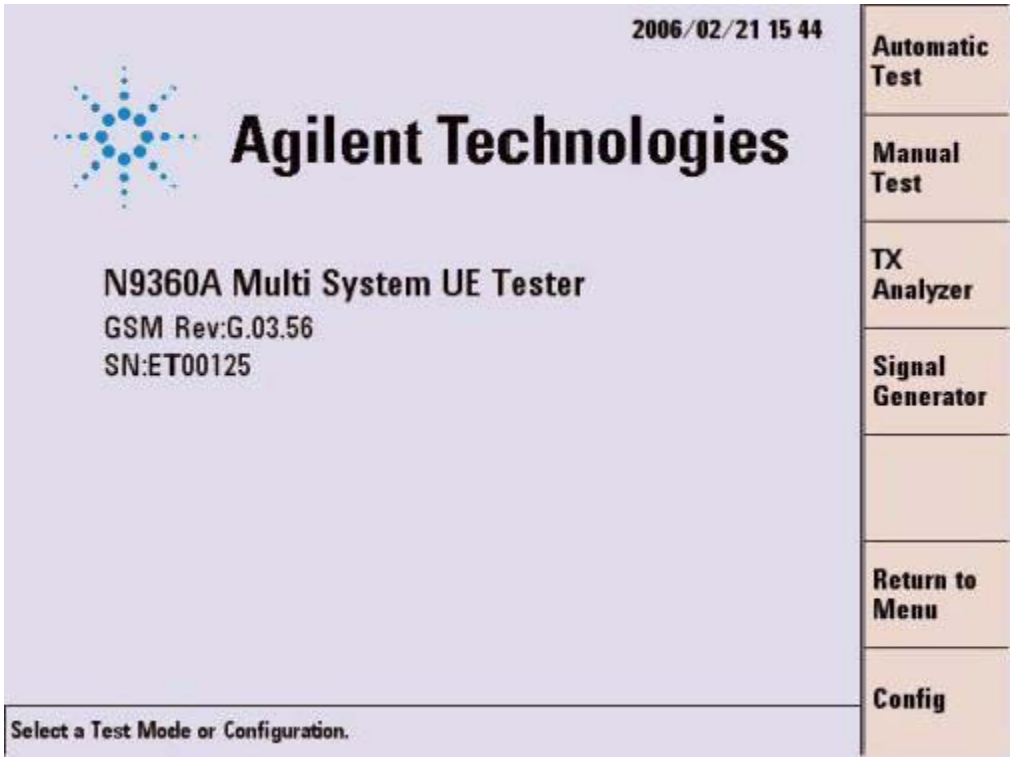
After selecting a system, the [Initial] screen as Figure 5-8 is displayed.

This screen is used to select one of the function modes or to return to the [Top Menu] screen.

To return to the [Initial] screen from any function mode, press the

Return softkey (multiple times if necessary).

Figure 5-8 [Initial] Screen



Softkey Menu Field

Softkey Menu

- **Automatic Test**: Displays the [Automatic Test: Stand-by] screen. Refer to Automatic Test on page 16.
- **Manual Test**: Displays the [Manual Test: Stand-by] screen. Refer to Manual Test (GSM Mode) on page 45, or Manual Test (GPRS Mode) on page 78.
- **TX Analyzer**: Displays the [TX Analyzer: Stand-by] screen. Refer to TX Analyzer on page 137.
- **Signal Generator**: Displays the [Signal Generator] screen. Refer to Signal Generator on page 166.
- **Return to Menu**: Displays the screen to return to the [Top Menu] screen. Refer to Return to Menu Screen on page 15.
- **Configuration**: Displays the [Configuration] screen. Refer to Configuration on page 168.

Screen Field

The firmware name and revision number currently installed are shown.

Set the input field in the screen field according to the following description of Table 5-2.

Table 5-2 [Initial] Screen Input Field

Input Field	Description
Procedure	Displays a list of up to four parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.

Message Field

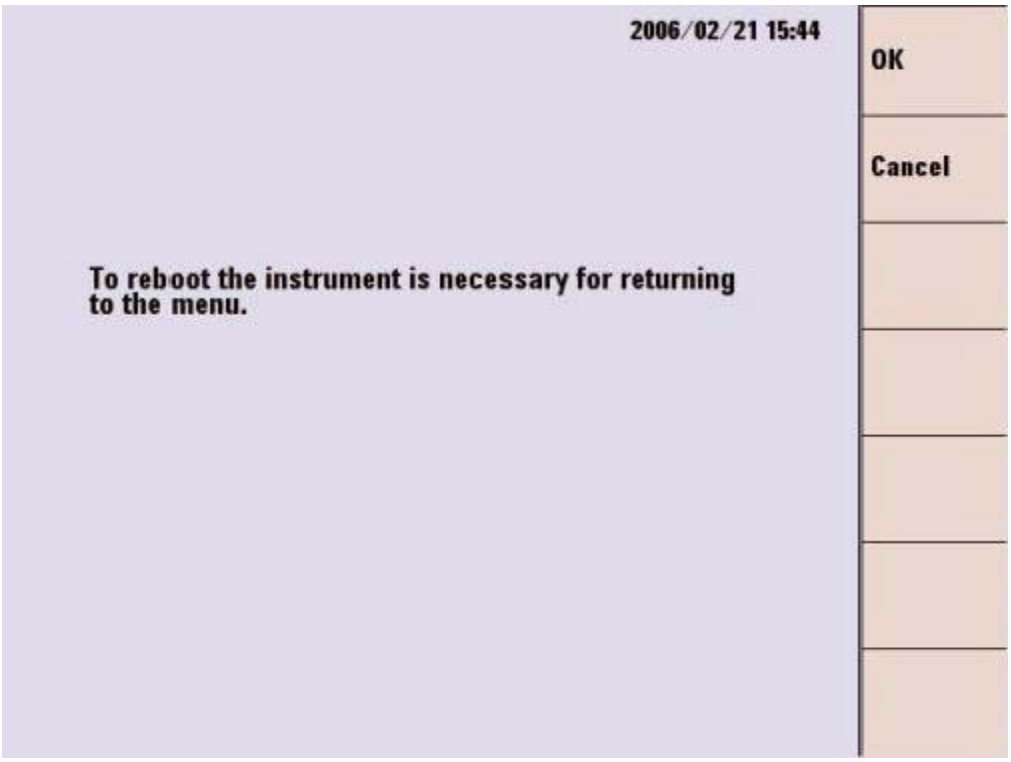
The following message is displayed in the message field:

Select a Test Mode or Configuration.

Return to Menu Screen

When the **Return to Menu** softkey is pressed on the [Initial] screen, the following screen as Figure 5-9 is displayed.

Figure 5-9 [Return to Menu] Screen



Softkey Menu Field

Softkey Menu

- **OK**: Returns to the [Top Menu] screen
- **Cancel**: Cancels returning to the [Top Menu] screen, and then returns to the [Initial] screen instead.

Screen Field

The following message is displayed in the screen field:

To reboot the instrument is necessary for returning to the menu.

Automatic Test

Feature of Automatic Test

The test flow set on the [Configuration: Test Condition] screen is automatically executed.

Setting for Automatic Test in Configuration Mode

- Loss:

  The path loss values for the radio systems can be set on the [Configuration] screen to correct the RF attenuation between the mobile phone and the Tester.

- ATT In/Out:

  The path loss values for each traffic channel can be set on the [Configuration: Test Sequence] screen to correct the RF tests results at each traffic channel in each radio system.

- Sequence:

  Up to two test sequences can be set on the [Configuration: Test Sequence] screen.

NOTE

The default state at power on is the last setting stored in the internal memory of the Tester before power off.

For numeric value entry, the changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

Test SIM

Insert the Test SIM provided by Agilent in the mobile phone before performing any test because the Tester will not be able to perform measurements with a SIM that is provided by cell phone operator or other Test SIMs.

Stand-by Screen

When the **Automatic Test** is pressed on the [Initial] screen, the [Automatic Test: Stand-by] simplified screen is displayed. Then, any of the [Automatic Test: Stand-by] simplified screen (Figure 5-10), the [Automatic Test: Stand-by] detailed screen

(Figure 5-11), or the [Automatic Test: Stand-by] value screen (Figure 5-12) is displayed according to the setting of the **Simple**, the **Detail** and the **Value** softkey.

Figure 5-10 [Automatic Test: Stand-by] Simplified Screen

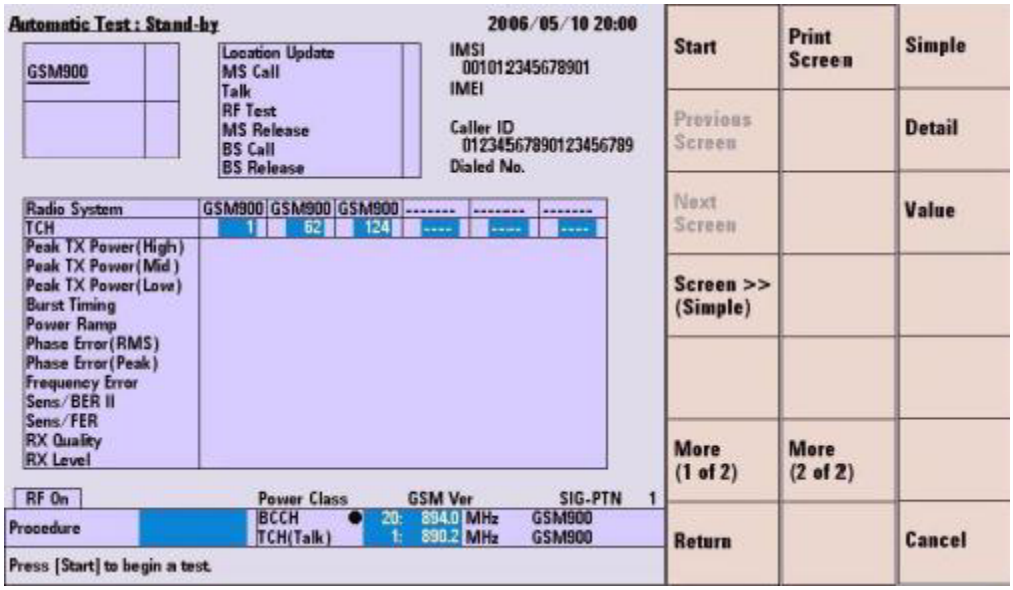


Figure 5-11 [Automatic Test: Stand-by] Detailed Screen

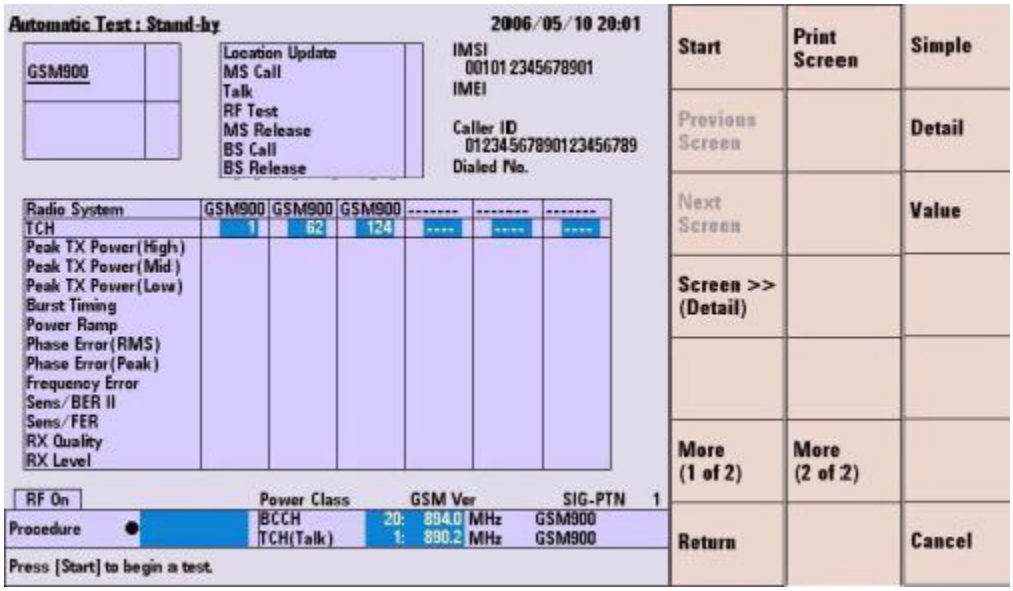
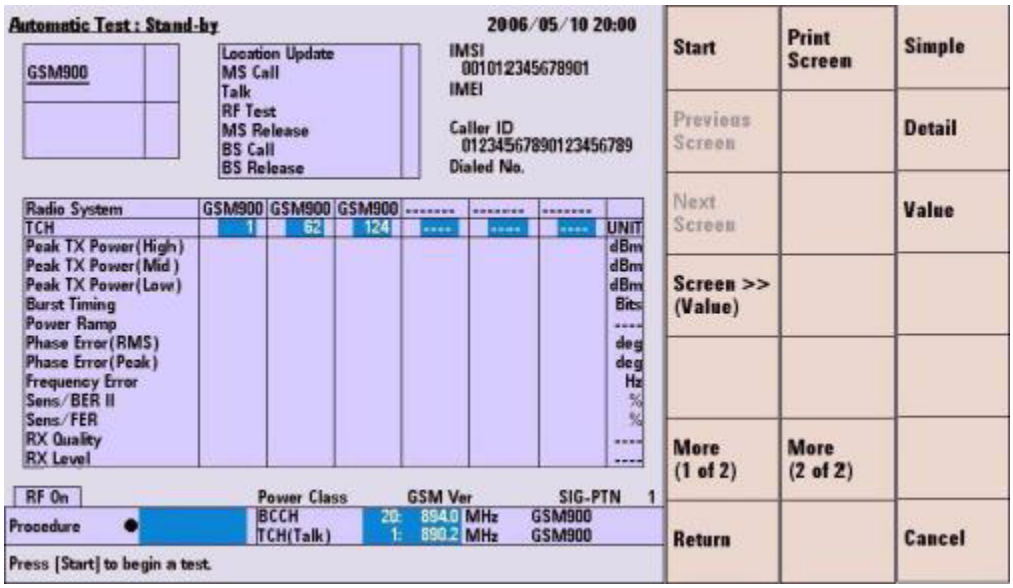


Figure 5-12 [Automatic Test: Stand-by] Value Screen



Softkey Menu Field

Softkey Menu 1

- **Start**: Starts testing the mobile phone by Automatic Test.
- **Previous Screen**: Changes the screen to the previous sequence one. This softkey is inactivated when the screen of the sequence 1 is displayed.
- **Next Screen**: Changes the screen to the next sequence one. This softkey is inactivated when the sequence 2 is set to `Off` or the screen of Sequence 2 is displayed.
- **Screen>>**: Displays the softkey menu 3 containing the softkeys to select the display mode.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Softkey Menu 3

- **Simple**: Displays a Pass or Fail result of whole measurement in the middle of the measurement result field in zoom.
- **Detail**: Displays a Pass or Fail result at each item cell in the measurement result field.
- **Value**: Displays a measurement value at each item cell in the measurement result field.
- **Cancel**: Cancels selecting the display mode and returns to the softkey menu 1.

Screen Fields

The input fields of parameters except procedure are protected if the **Panel Key** is set to `Lock` on the [Configuration] screen.

Set the input fields in the screen field according to the following description of Table 5-3 to execute a new test.

Table 5-3 [Automatic Test: Stand-by] Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`

Table 5-3 [Automatic Test: Stand-by] Screen Input Field

Input Field	Description
TCH (Talk) *	Sets a traffic channel number for Talk tests. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
TCH *	Sets up to the six traffic channels number for RF tests. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

Table 5-4 describes measurement items in Automatic Test. The limits for measurement items can be set on the [Configuration: Test Condition] screen.

Table 5-4 Automatic Test Measurement Item

Measurement Item	Description
Peak TX Power (High)	Measures and analyzes the peak transmission level on the **PWR CNTL High** condition set on the [Configuration: Test Condition] screen.
Peak TX Power (Mid)	Measures and analyzes the peak transmission level on the **PWR CNTL Mid** condition set on the [Configuration: Test Condition] screen.
Peak TX Power (Low)	Measures and analyzes the peak transmission level on the **PWR CNTL Low** condition set on the [Configuration: Test Condition] screen.
Burst Timing	Measures and analyzes the burst timing of transmission signal.
Power Ramp	Measures and analyzes amplitude envelope of the RF burst signal in the timeslot.
Phase Error (RMS)	Measures and analyzes the RMS (Root Mean Square) phase error over the active part of the timeslots between 0 to 147 bits.
Phase Error (Peak)	Measures and analyzes the peak phase error over the active part of the timeslots between 0 to 147 bits.
Frequency Error	Measures and analyzes the frequency error over the active part of the timeslots.
Sensitivity/BER II	Measures and analyzes the receiving sensitivity by the measurement of the BER (Bit Error Rate) using the loopback function.
Sensitivity/FER	Measures and analyzes the receiving sensitivity by the measurement of the FER (Frame Error Rate) using the loopback function.

Table 5-4 Automatic Test Measurement Item

Measurement Item	Description
RX Quality	Measures and analyzes the received signal quality with the mobile phone.
RX Level	Measures and analyzes the received signal level with the mobile phone.

The Radio System(s) (GSM850, GSM900, DCS1800, PCS1900) is or are shown.

If some test items in the signaling step is set to be skipped on the [Configuration: Test Sequence] screen, — is shown at the corresponding steps in the test result table.

If some measurement items are set to be skipped on the [Configuration: Test Sequence] screen, — is shown at those item cells in the measurement result field.

RF On indicator is displayed at the lower-left corner of the screen only when the RF signal from the Tester is presented at the RF In/Out connector.

The information from the mobile phone as Table 5-5 is displayed in the screen field.

Table 5-5 [Automatic Test: Stand-by] Screen Mobile Phone Information

Item Information	Description
IMSI	Displays the default value of International Mobile Subscriber Identity. The default value is `001012345678901`.
IMEI	This field remains blank at this state.
Caller ID	Displays addresser number sent from the Tester at BS Call execution. The set value is displayed at this state.
Dialed No.	This field remains blank at this state.
Power Class	This field remains blank at this state.
GSM Version	This field remains blank at this state.
SIG-PTN	Displays signaling pattern. The value set in the [Condition: Test Condition] screen is inserted.

Message Field

The following message is displayed in the message field on the [Stand-by] screen:

Press {Start} to begin a test.

The word surrounded by {} in the message field denotes the softkey.

Measuring Screen

When the **Start** softkey is pressed on the [Automatic Test: Stand-by] screen, a [Automatic Test: Measuring] screen is displayed and then a test starts.

The status of sequences is shown in the upper left corner of the screen. The sequence under test execution is underlined.

One of the test flow steps is highlighted to show which step is currently being tested. While the RF Test step is highlighted, each of the measurement items is highlighted sequentially to obtain a measurement result.

The test result of sequences and signaling steps are shown as follows:

- **P**: Shown on blue background when the test is passed.
- **F**: Shown on red background when the test is failed.

During test, any of the [Automatic Test: Measuring] simple screen (Figure 5-13), the [Automatic Test: Measuring] detailed screen (Figure 5-14), or the [Automatic Test: Measuring] value screen (Figure 5-15) is displayed, according to the setting of the **Simple**, the **Detail** or the **Value** softkey.

Figure 5-13 [Measuring] Simplified Screen

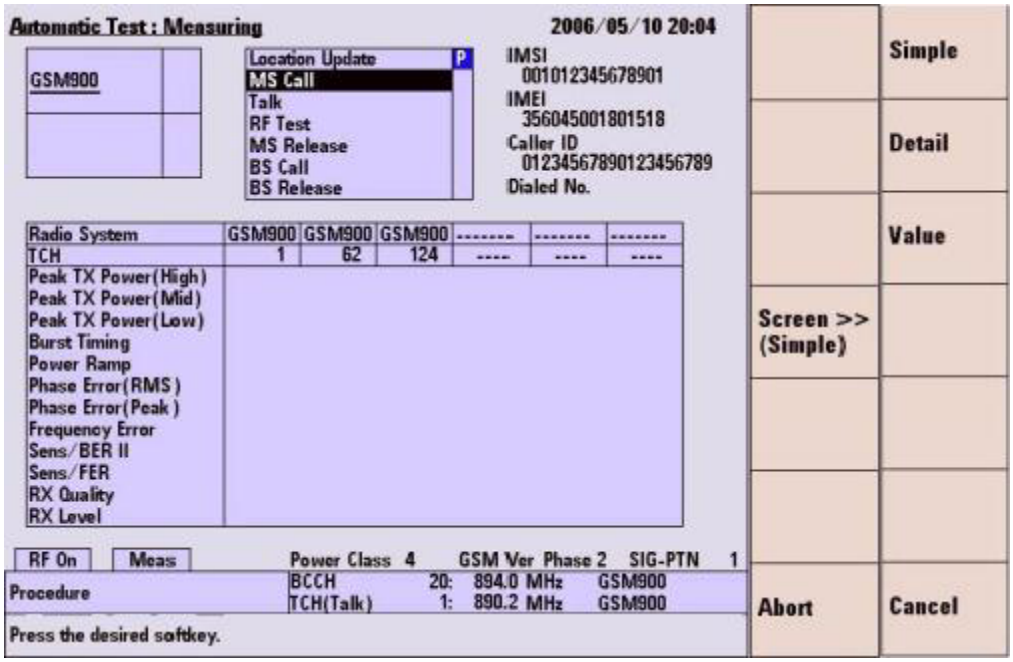


Figure 5-14 [Measuring] Detailed Screen

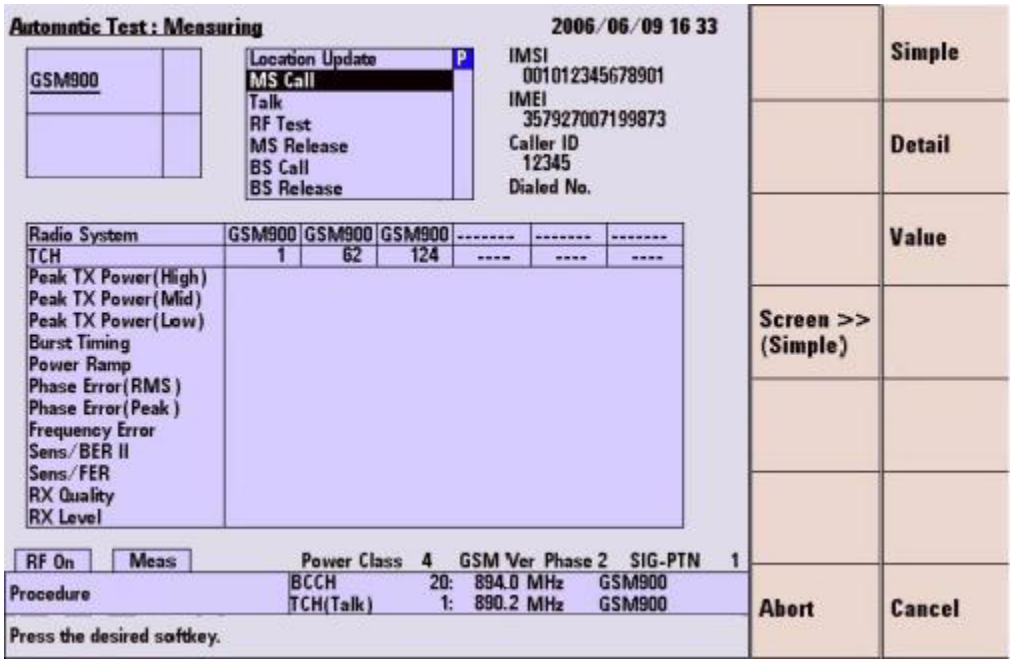
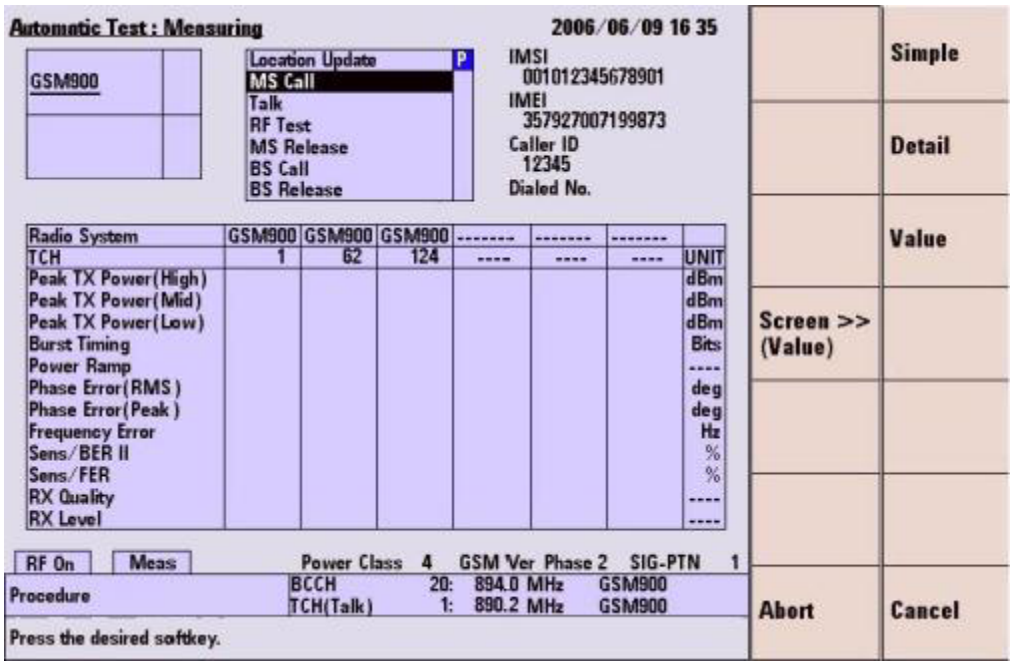


Figure 5-15 [Measuring] Value Screen



Softkey Menu Field

Softkey Menu 1

- **Screen>>**: Displays the softkey menu 2 containing the softkeys to select the display mode.
- **Abort**: Aborts the measurement and returns to the [Stand-by] screen.

Softkey Menu 2

- **Simple**: Displays a Pass/Fail result of whole measurement in the middle of the measurement result field in zoom.
- **Detail**: Displays a Pass/Fail result at each item cell in the measurement result field.
- **Value**: Displays a measurement value at each item cell in the measurement result field.
- **Cancel**: Cancels changing the display mode and returns to the softkey menu 1.

Screen Field

The information from the mobile phone as Table 5-6 is displayed in the screen field

Table 5-6 [Automatic Test: Measuring] Screen Mobile Phone Information

Item Information	Description
IMSI	Displays the International Mobile Subscriber Identity from the mobile phone.
IMEI	Displays the International Mobile station Equipment Identity from the mobile phone.
Caller ID	Displays addresser number sent from the Tester at BS Call execution. The set value is displayed at this state.
Dialed No.	Displays the number dialed from the mobile phone.
Power Class	Displays power class information of the mobile phone. Refer to Power Classes on page 2.
GSM Version	Displays either Phase 1 or Phase 2 defined by the mobile phone.
SIG-PTN	Displays signaling pattern. The value set in the [Condition: Test Condition] screen is inserted.

Message Field

The following message is displayed on [Measuring] screens:

Press the desired softkey.

Measuring Talk Screen

During Talk step execution, a [Measuring] Talk screen is displayed.

Any of the [Automatic Test: Measuring] Talk simple screen (Figure 5-16), the [Automatic Test: Measuring] Talk detailed screen (Figure 5-17), or the [Automatic Test: Measuring] Talk value screen (Figure 5-18) is displayed, according to the setting of the **Simple**, the **Detail** or the **Value** softkey.

Figure 5-16 [Measuring] Talk Simplified Screen

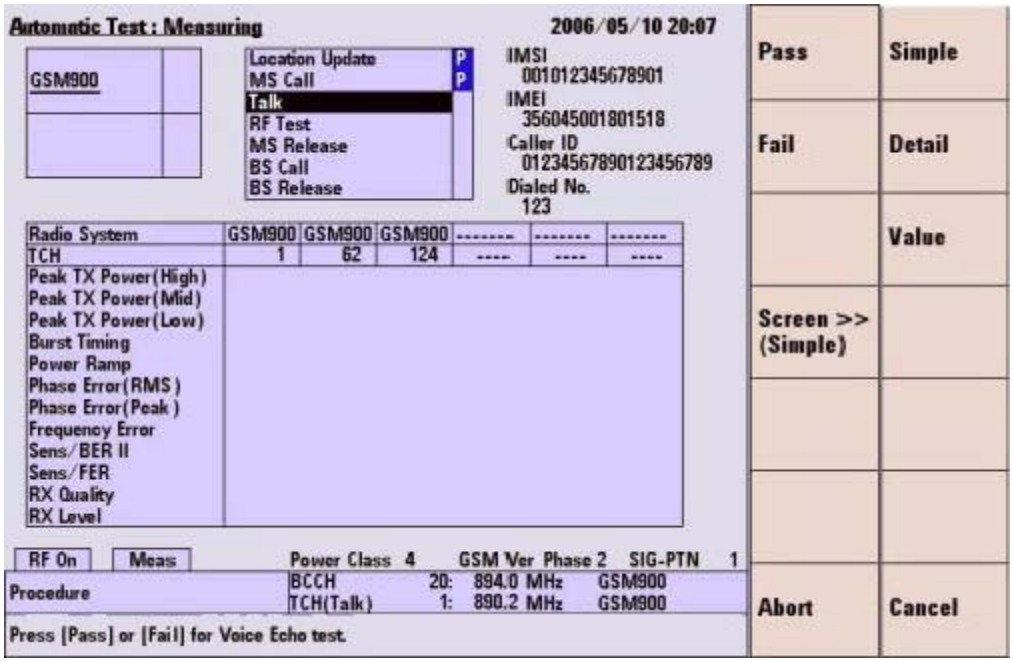


Figure 5-17 [Measuring] Talk Detailed Screen

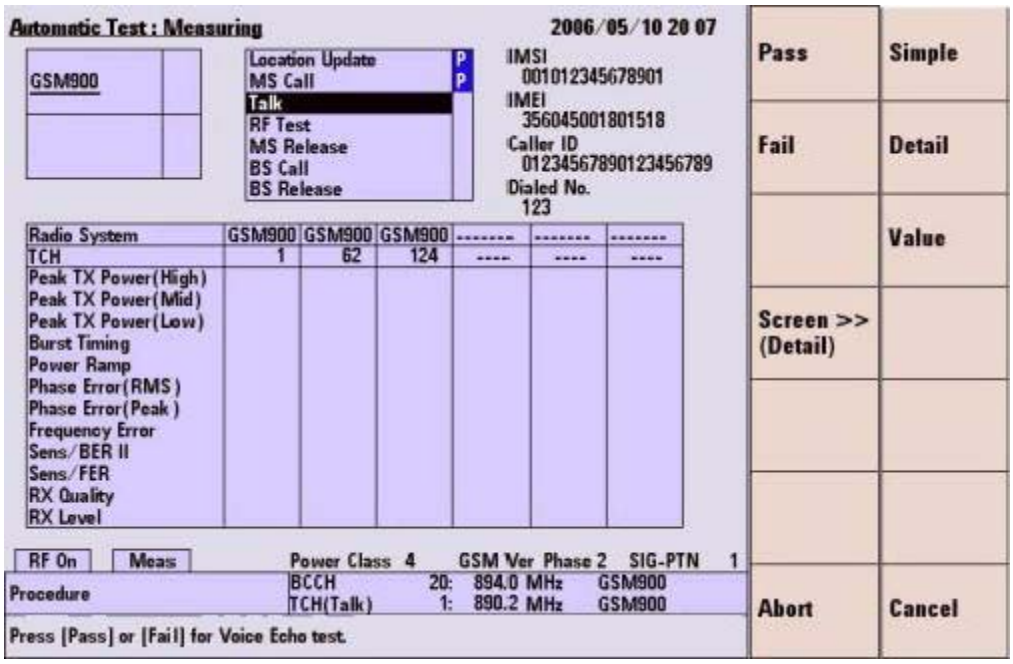
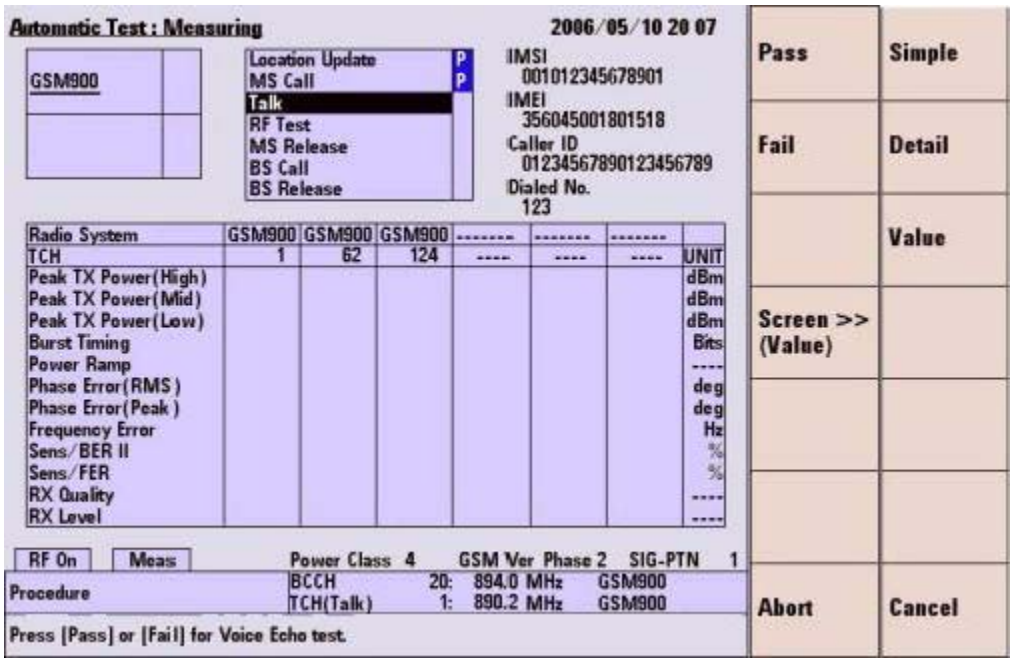


Figure 5-18 [Measuring] Talk Value Screen



Softkey Menu Field

Softkey Menu 1

- **Pass**: Press this softkey if your voice loops back from the mobile phone with good quality. Then this softkey disappears and **P** is shown next to **Talk** step.
- **Fail**: Press this softkey if your voice loops back from the mobile phone with poor quality or your voice does not loop back from the mobile phone. Then this softkey disappears and **F** is shown next to **Talk** step.
- **Screen>>**: Displays the softkey menu 2 containing the softkeys to select the display mode.
- **Abort**: Aborts the test and returns to the [Stand-by] screen.

Softkey Menu 2

- **Simple**: Displays a Pass/Fail result of whole measurement in the middle of the measurement result field in zoom.
- **Detail**: Displays a Pass/Fail result at each item cell in the measurement result field.

- **Value**: Displays a measurement value at each item cell in the measurement result field.
- **Cancel**: Cancels changing the display mode and returns to the softkey menu 1.

Screen fields

During the test, the operator must respond to operation or Tester messages by pressing the appropriate softkeys of the Tester or by pressing the mobile phone's button.

The information from the mobile phone is displayed at the upper right corner in the screen field. Refer to Table 5-6 [Automatic Test: Measuring] Screen Mobile Phone Information on page 25.

Message Field

The following message is displayed in the message field during Talk test on [Measuring] Talk screens:

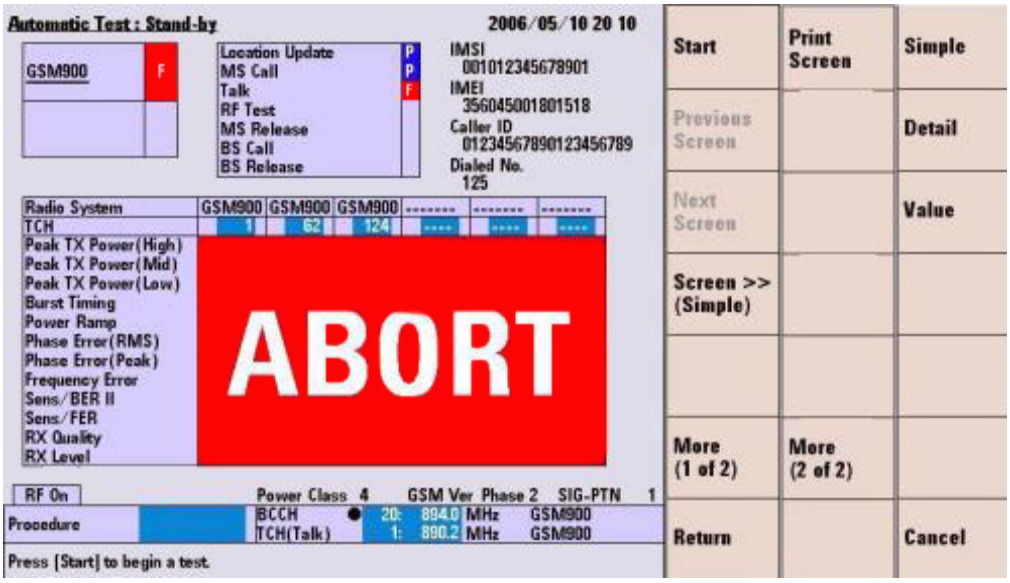
Press {Pass} or {Fail} for Voice Echo test.

The word surrounded by {} in the message field denotes the softkey.

Aborted screen

When the **Abort** softkey is pressed, the measurement is aborted. Any of the [Automatic Test: Stand-by] aborted simplified screen, the [Automatic Test: Stand-by] aborted detailed screen, or the [Automatic Test: Measuring] aborted value screen is displayed, depending on the previous setting of the **Simple**, the **Detail** or the **Value** softkey. Figure 5-19 is a screen with the **Simple** softkey setting.

Figure 5-19 [Stand-by] Aborted Simplified Screen



Softkey Menu Field

Softkey Menu 1

- **Start**: Starts testing the mobile phone by Automatic Test.
- **Previous Screen**: Changes the screen to the previous sequence one. This softkey is inactivated when the screen for the sequence 1 is displayed.
- **Next Screen**: Changes the screen to the next sequence one. This softkey is inactivated when the sequence 2 is set to `Off` or the screen of Sequence 2 is displayed.
- **Screen>>**: Displays the softkey menu 3 containing the softkeys to select the display mode.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Softkey Menu 3

- **Simple**: Displays a Pass/Fail result of whole measurement in the middle of the measurement result field in zoom.
- **Detail**: Displays a Pass/Fail result at each item cell in the measurement result field.
- **Value**: Displays a measurement value at each item cell in the measurement result field.
- **Cancel**: Cancels changing the display mode and returns to the softkey menu 1.

Screen Field

The information in the screen field is displayed. Refer to Table 5-3 [Automatic Test: Stand-by] Screen Input Field on page 19 and Table 5-6 [Automatic Test: Measuring] Screen Mobile Phone Information on page 25. The input field in the screen field can be changed for a new test.

Explanation

Detailed measurement results up to the aborted operation can be obtained for further analysis from the Detail screen and the Value screen. Place the circular cursor at one of the Pass/Fail result or result value cells and press the CURSOR CONTROL knob to display the Graph/Value screen containing detailed measurement results.

The status of the Tester is reset to stand-by.

The condition of transmission from the mobile phone is not ensured; therefore, the mobile phone power-on process needs to be repeated for a new test.

Sequence 2 Screen

When Sequence 2 is set on the [Configuration: Test Sequence] screen in the Configuration mode, Sequence 2 start after completion of BS Release in Sequence 1.

The state of the sequences is shown on the upper left screen. The sequence in processing (Sequence 2 now) is underlined.

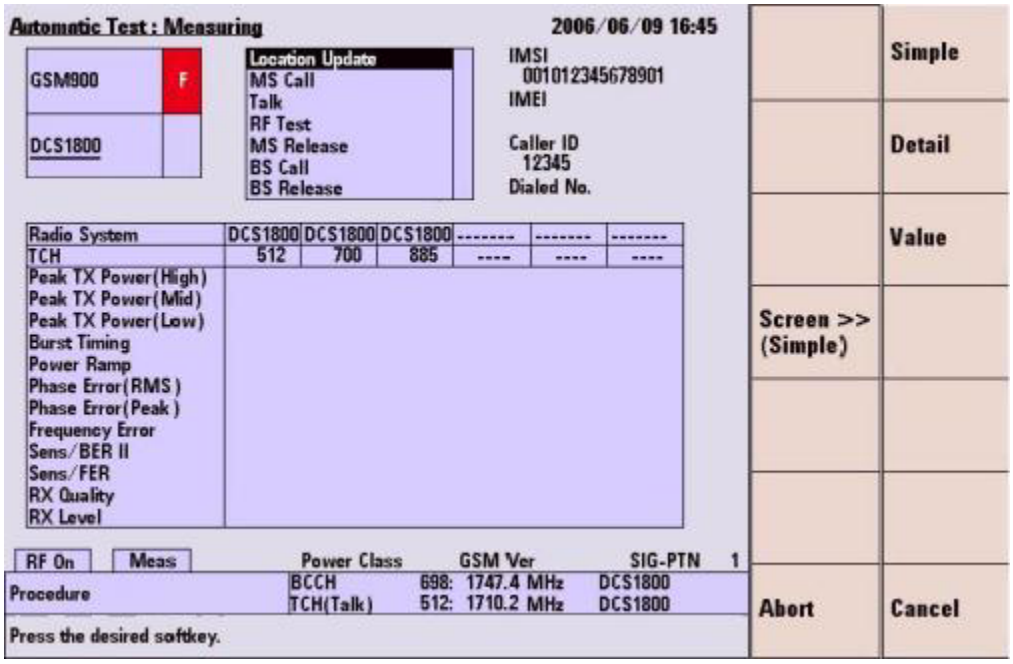
Test result of sequences is shown as follows:

- **P**: Shown on blue background when the test is passed.

- **F**: Shown on red background when the test is failed.

When Sequence 2 starts, the [Automatic Test: Measuring] screen as Figure 5-20 is displayed.

Figure 5-20 [Measuring] Next Sequence 2 Screen



Softkey Menu 1

- **Screen>>**: Displays the softkey menu 2 containing the softkeys to select the display mode.
- **Abort**: Aborts the test and returns to the [Stand-by] screen.

Softkey Menu 2

- **Simple**: Displays a Pass/Fail result of whole measurement in the middle of the measurement result field in zoom.
- **Detail**: Displays a Pass/Fail result at each item cell in the measurement result field.
- **Value**: Displays a measurement value at each item cell in the measurement result field.
- **Cancel**: Cancels changing the display mode and returns to the softkey menu 1.

Summary Screen

When all tests in preset sequences are completed, measurement results are displayed on the [Stand-by] summary simplified screen (Figure 5-21), the [Stand-by] summary detailed screen (Figure 5-22) or the [Stand-by] summary value screen (Figure 5-23) depending on the previous setting of the **Simple**, the **Detail** or the **Value** softkey.

Measurement results are shown as follows:

- `Pass` or measurement value: Shown on blue background when the measurement is passed.
- `Fail` or measurement value: Shown on red background when the measurement is failed.

Measurement result is shown in different ways depending on the display mode.

- On the summary simplified screen, an enlarged `Pass` is shown in the middle of the measurement result field when all measurement items are passed. An enlarged `Fail` is shown when even one measurement item is failed.
- On the summary detailed screen, a Pass or Fail measurement result is shown at each item cell in the measurement result field.
- On the summary value screen, a measurement value is shown at each item cell in the measurement result field.

When some signaling test items and measurement items are set to be skipped on the [Configuration: Test Condition] screen, each result of test items and measurement items is shown by – or —.

Figure 5-21 [Stand-by] Summary Simplified Screen

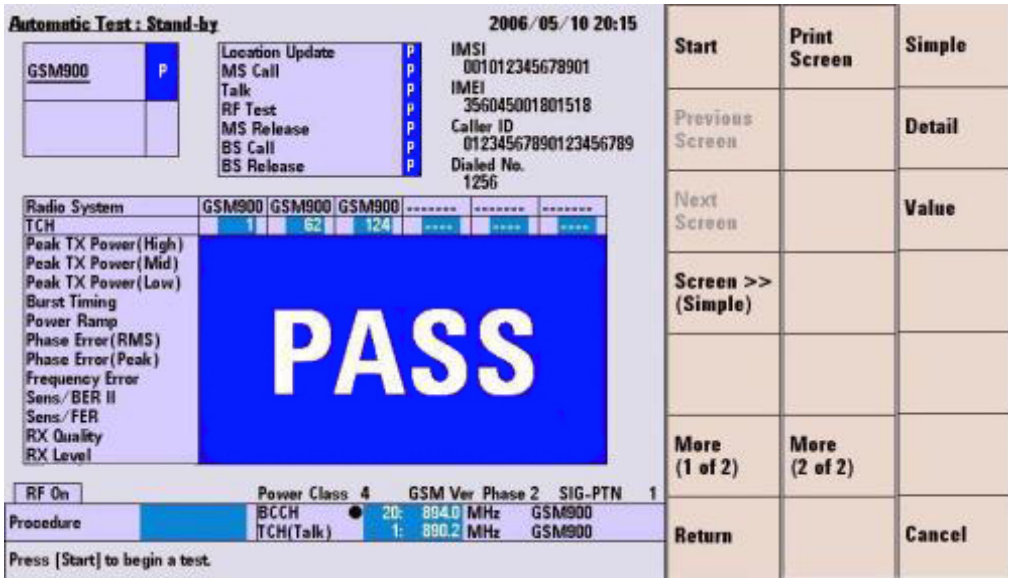


Figure 5-22 [Stand-by] Summary Detailed Screen

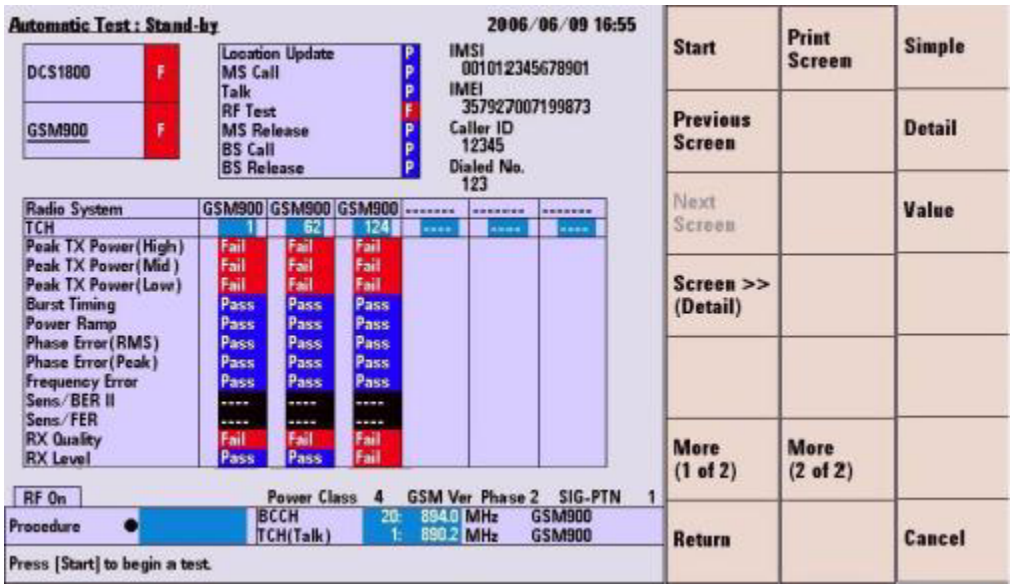
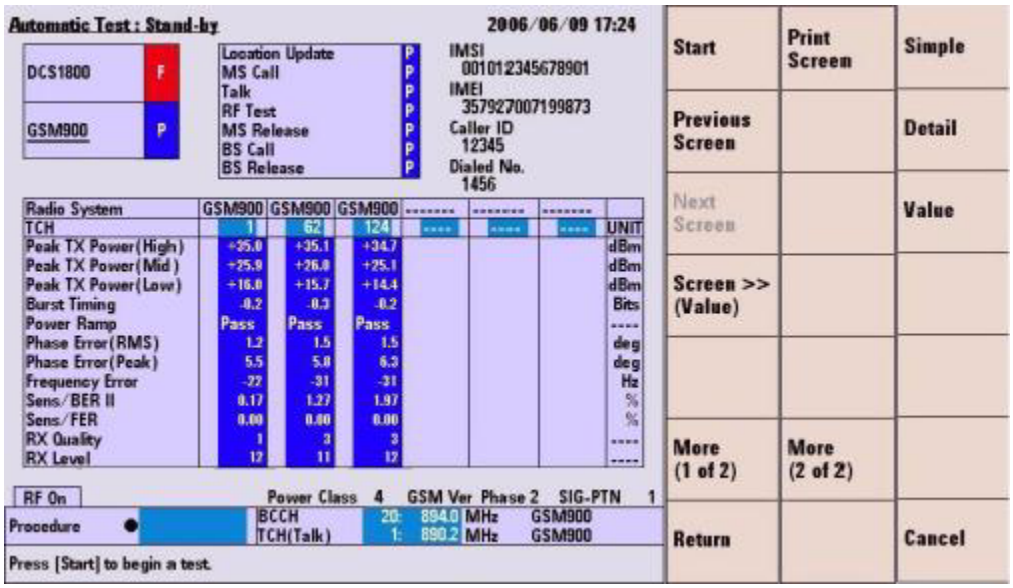


Figure 5-23 [Stand-by] Summary Value Screen



Softkey Menu Field

Softkey Menu 1

- **Start**: Starts testing the mobile phone by Automatic Test.
- **Previous Screen**: Changes the screen to the previous sequence one. This softkey is inactivated when the screen of the sequence 1 is displayed.
- **Next Screen**: Changes the screen to the next sequence one. This softkey is inactivated when the sequence 2 is set to `Off` or the screen of Sequence 2 is displayed.
- **Screen>>**: Displays the softkey menu 3 containing the softkeys to select the display mode.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Softkey Menu 3

- **Simple**: Displays a Pass/Fail result of whole measurement in the middle of the measurement result field in zoom.
- **Detail**: Displays a Pass/Fail result at each item cell in the measurement result field.
- **Value**: Displays a measurement value at each item cell in the measurement result field.
- **Cancel**: Cancels changing the display mode and returns to the softkey menu 1.

Screen Field

Set the input fields in the screen field according to the following description of Table 5-7 to execute a new test.

Table 5-7 [Automatic Test: Stand-by] Summary Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
TCH (Talk) *	Sets a traffic channel number for Talk tests. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
TCH *	Sets up to the six traffic channels number for RF tests. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The information from the mobile phone as Table 5-8 is displayed in the screen field.

Table 5-8 [Automatic Test: Measuring] Screen Mobile Phone Information

Item Information	Description
IMSI	Displays the International Mobile Subscriber Identity from the mobile phone.
IMEI	Displays the International Mobile station Equipment Identity from the mobile phone.
Caller ID	Displays addresser number sent from the Tester at BS Call execution. The set value is displayed at this state.
Dialed No.	Displays the number dialed from the mobile phone.
Power Class	Displays power class information of the mobile phone. Refer to Power Classes on page 2.
GSM Version	Displays either Phase 1 or Phase 2 defined by the mobile phone.
STG-PTN	Displays signaling pattern. The value set in the [Condition: Test Condition] screen is inserted.

Message Field

The following message is displayed in the message field on the [Stand-by] screen:

Press {Start} to begin a test.

The word surrounded by {} in the message field denotes the softkey.

Procedure to Obtain a Graph/Value Screen from the Summary Detailed Screen or the Summary Value Screen

Display a Graph/Value screen containing detailed test results with the following procedure:

Step 1

Place the circular cursor at one of Pass/Fail result cells or measurement value cells in the measurement result field by rotating the CURSOR CONTROL knob.

Step 2

Select the measurement result cell by pressing the CURSOR CONTROL knob one time.

Step 3

Either a measurement result list or a graph with a measurement result list is displayed according to each measurement item.

The following section describes Graph/Value screens with measurement results and the softkey menu.

Graph/Value Screen

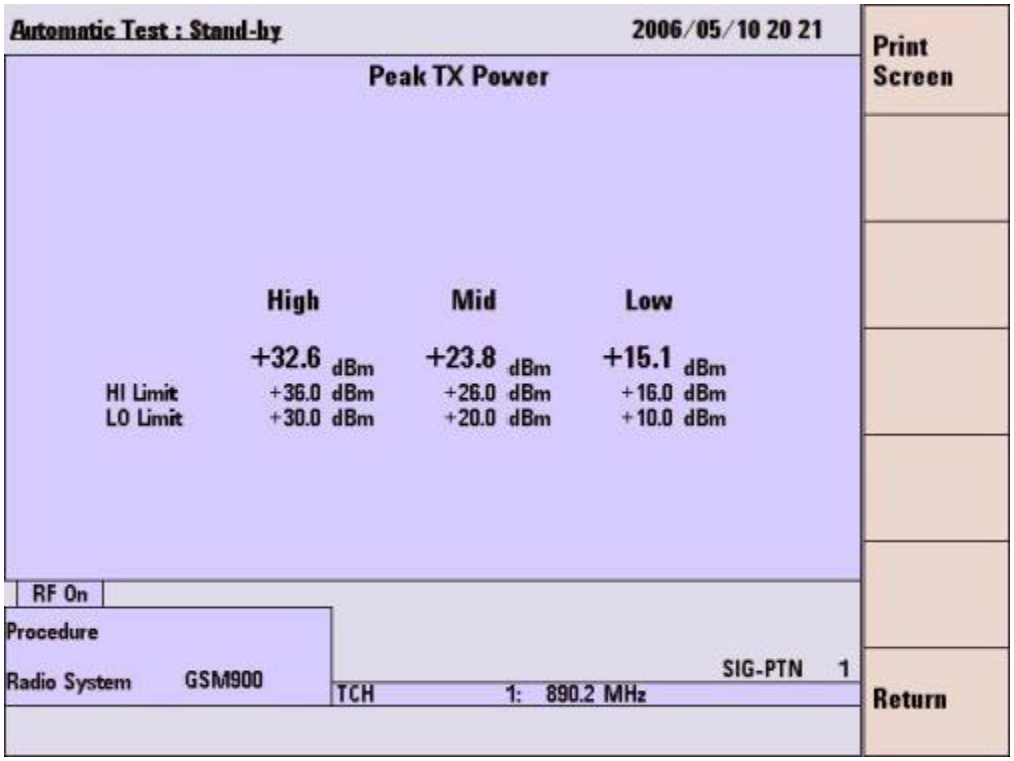
Peak TX Power

This function measures and analyzes peak transmission power with three different levels against the limits set on the [Configuration: Test Condition] screen.

The actual measured data is shown with enlarged numerals.

Any data indicating a failure is highlighted.

Figure 5-24[Stand-by] Peak TX Power Screen



Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Return**: Returns to the previous screen.

Screen Field

The measurement results are shown in the screen field.

Table 5-9 [Automatic Test] Peak TX Power Screen Field

Screen Field	Description
High	Measured Peak TX Power of PWR CNTL at high range, the Hi and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
Mid	Measured Peak TX Power of PWR CNTL at middle range, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
Low	Measured Peak TX Power of PWR CNTL at low range, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Burst Timing/ Power Ramp

This function measures and analyzes the power burst timing and the amplitude envelope in the timeslots of the RF burst signal.

Readout function is available for the Power Ramp measurement. In this function, that data is shown when the marker is placed at any point of the Power Ramp measured trace. The measured data for Burst Timing and Power Ramp are shown as Figure 5-25.

If the measured data exceeds the limits in the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-25 [Stand-by] Burst Timing/ Power Ramp Screen

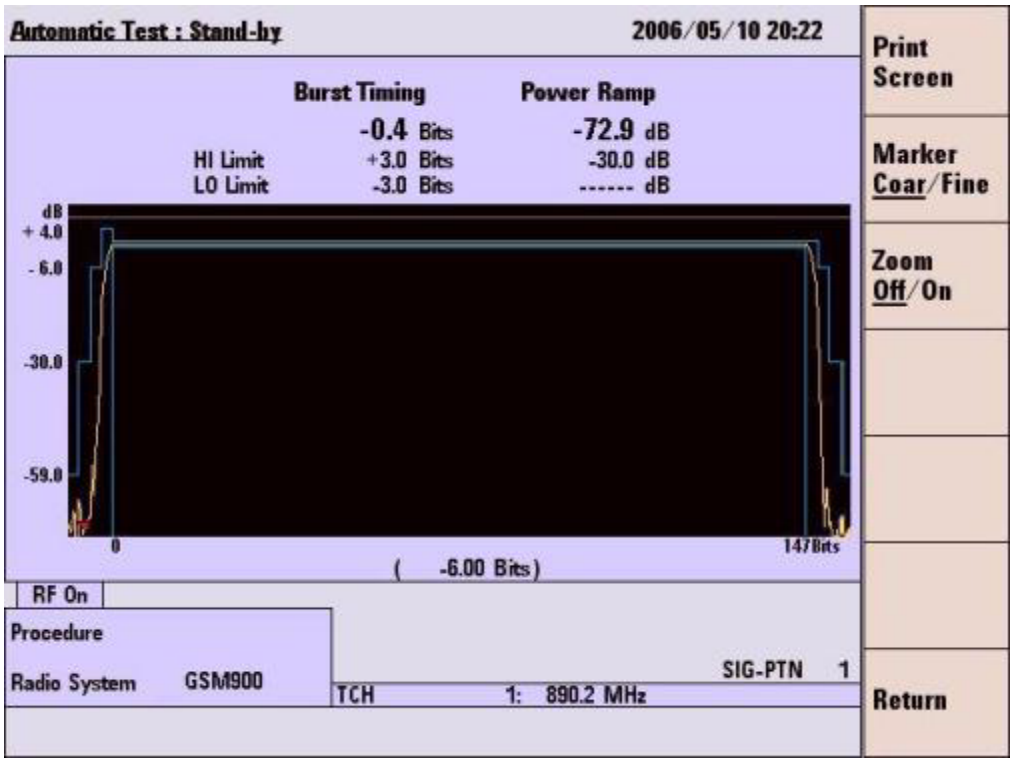
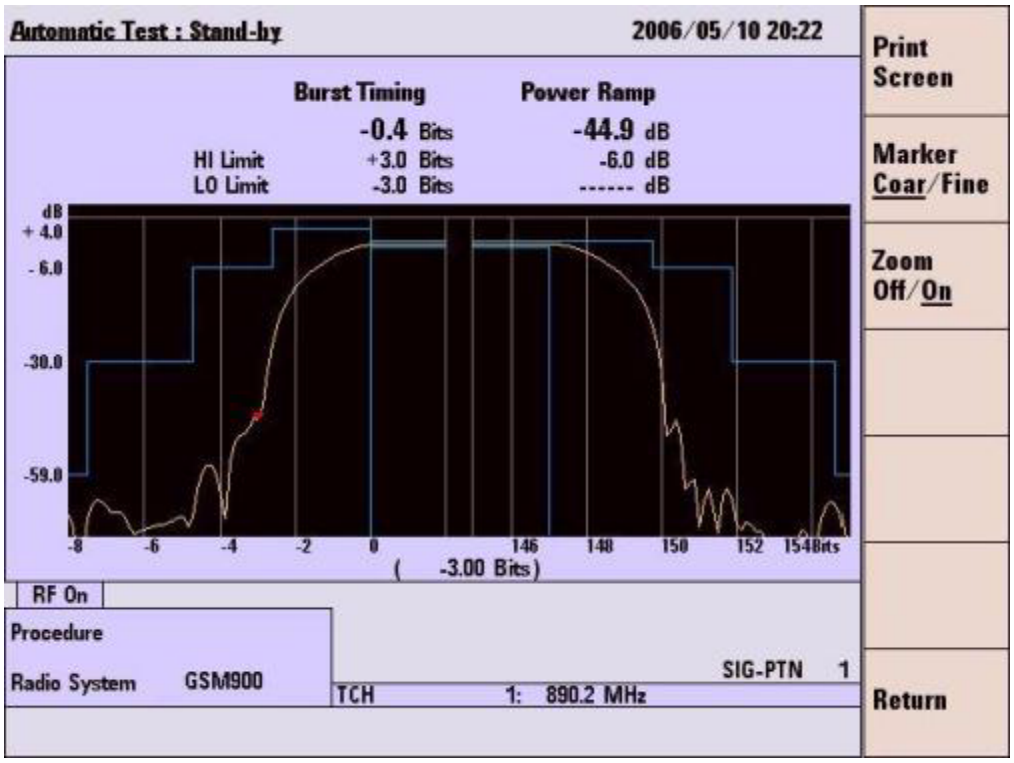


Figure 5-26 [Stand-by] Burst Timing/ Power Ramp Zoomed Screen



Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the amplitude and timeslot (in bits) is available at any point of the measured trace.
- **Zoom Off/On**: Selects the zooming function from `Off` and `On`. If `On` is selected, the rising and trailing edges of the Power Ramp waveforms are expanded to observe the details as shown in Figure 5-26.
- **Return**: Returns to the previous screen.

NOTE A Pass/Fail judgment is not given while transmission power is off.

Screen Field

The measurement results are shown in the screen field.

Table 5-10 [Automatic Test] Burst Timing/Power Ramp Screen Field

Screen Field	Description
Burst Timing	Measured Burst Timing, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
Power Ramp	Measured Power Ramp, the HI and the LO Limit are shown. The Limits are specified by the radio system selected (template).

Phase Error/ Frequency Error

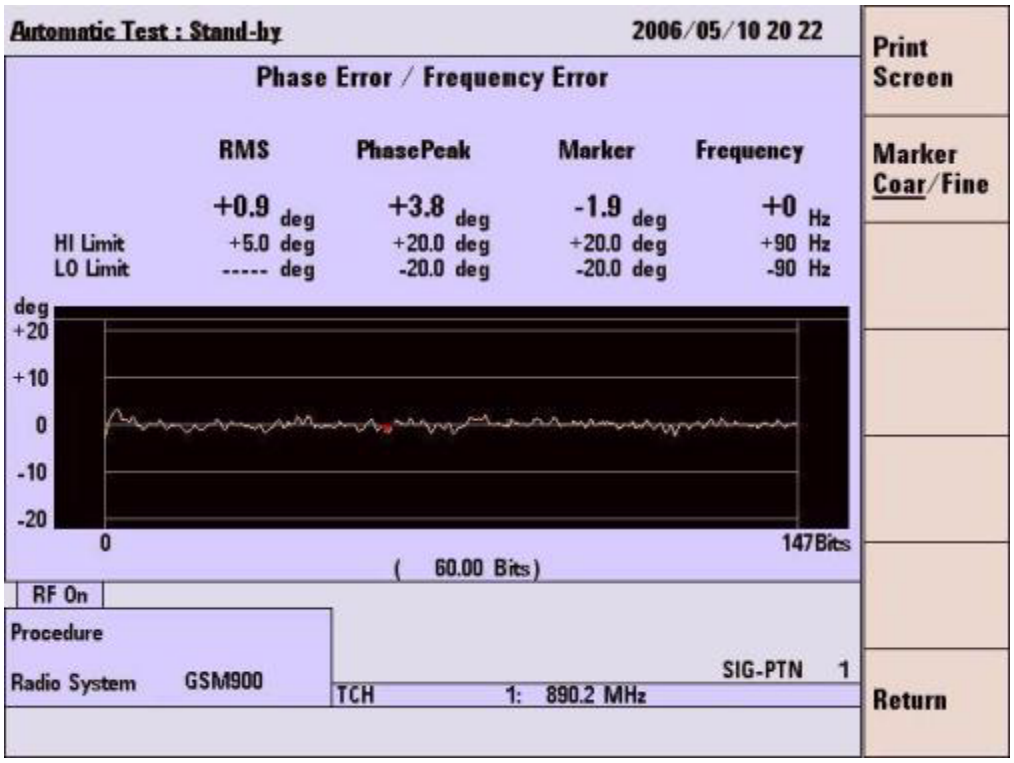
This function measures and analyzes the RMS and peak phase errors and frequency error over the active part of the timeslot between `0` to `147` bits.

The measurement data for RMS Phase Error, Peak Phase Error, and Frequency Error are shown with enlarged numerals as Figure 5-27.

If the measured data exceeds the limits in the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-27 [Stand-by] Phase Error Screen



Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the phase error magnitude and timeslot (in bits) are available at any point of the measurement trace.
- **Return**: Returns to the previous screen.

Screen Field

The measurement results are shown in the screen field.

Table 5-11 [Automatic Test] Phase Error/Frequency Error Screen Field

Screen Field	Description
RMS	Measured Phase Error (RMS) and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
Phase Peak	Measured Phase Error (Peak), the HI and the LO Limit are shown. A set of the HI and the LO Limit is set on the [Configuration: Test Condition] screen.
Marker	Measured Phase Error at the marker position, the HI and the LO Limit are shown. Measured data is shown when the marker is placed on the measurement trace. The HI Limit is set on the [Configuration: Test Condition] screen.
Frequency	Measured Frequency Error, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Sensitivity/ RX Quality/ RX Level

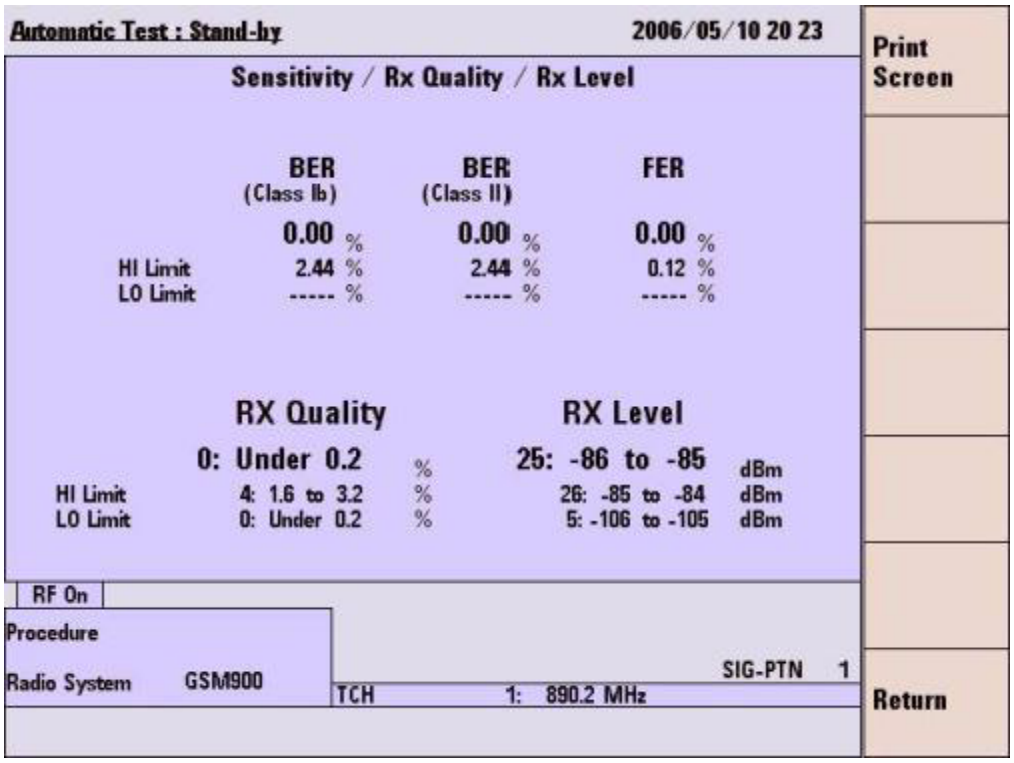
This function measures and analyzes the received sensitivity in the BER (bit error rate) and FER (frame error rate) formats using the loop back function of the mobile phone.

Also, measurement result for RX Quality and RX Level, which are measured with the mobile phone and reported as measurement reports, are shown.

The measurement data of BER, FER, RX Quality and RX Level are shown as Figure 5-28.

Any data indicating a failure is highlighted.

Figure 5-28 [Stand-by] Sensitivity/ RX Quality/ RX Level Screen



Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Return**: Returns to the previous screen.

Screen Field

The measurement results are shown in the screen field.

Table 5-12 [Automatic Test] Phase Error/Frequency Error Screen Field

Screen Field	Description
BER (Class Ib)	Measured BER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.

Table 5-12 [Automatic Test] Phase Error/Frequency Error Screen Field

Screen Field	Description
BER (Class II)	Measured BER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
FER	Measured FER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
RX Quality	RX Quality measured with the mobile phone, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
RX Level	RX Level measured with the mobile phone, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Manual Test (GSM Mode)

Feature of Manual Test

- All test items are executed while the mobile phone and the Tester are connected by call control protocol.
- Measurement in the Talk/RF test step in the test flow is executed in a real-time.

Setting for Manual Test in the Configuration Mode

- Loss:

  The path loss values for each radio system can be set on the [Configuration] screen to correct the RF attenuation between the mobile phone and the Tester.

- Limits of measurement items:

  Each measurement item can be measured and analyzed with test limits set on the [Configuration: Test Condition] screen.

NOTE

The default state is the last setting stored in the internal memory of the Tester before power off.

For numeric value entry, The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

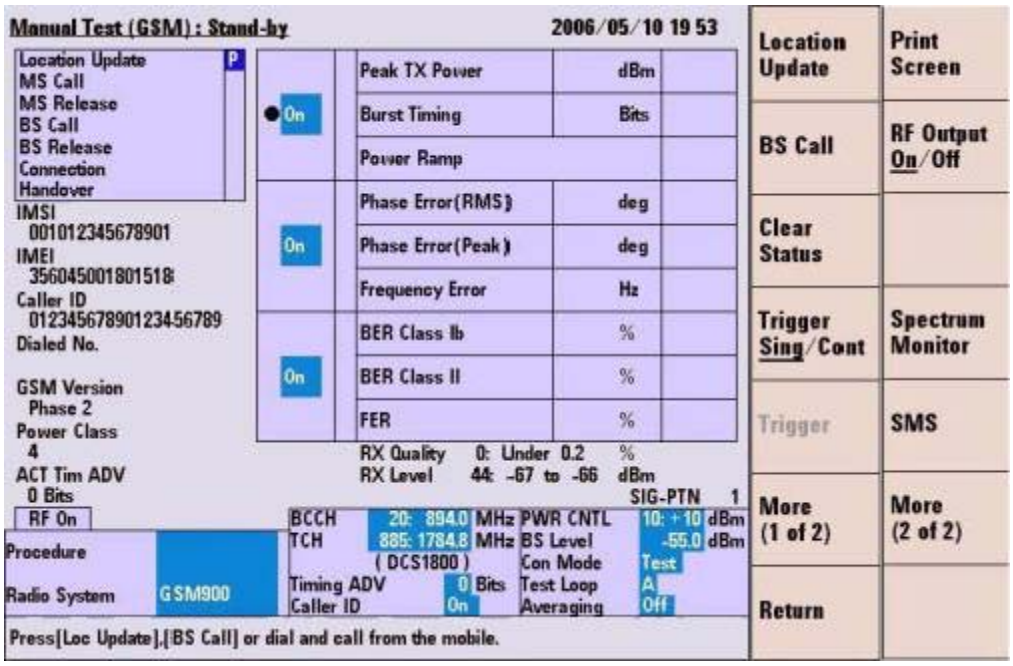
Test SIM

Insert the Test SIM provided by Agilent in the mobile phone before performing any test because the Tester will not be able to perform measurements with a SIM that is provided by cell phone operator or other Test SIMs.

Stand-by Screen

When the **Manual Test** softkey is pressed on the [Initial] screen, the [Manual Test: Stand-by] screen as Figure 5-29 is displayed.

Figure 5-29 [Manual Test: Stand-by] GSM Mode Screen



Softkey Menu Field

Softkey Menu 1

- **Location Update**: Executes the Location Update process for the Tester.
- **BS Call**: Executes BS Call.
- **Clear Status**: Clears Pass/Fail results at signaling steps in the test flow.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).

- The `Sing` mode setting provides single measurement in RF test.
- The `Cont` mode setting provides continuous measurement in RF test.

- **Trigger**: Starts measurement in the connection status. This softkey is inactivated in the stand-by status but activated in the connection status.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **SMS**: Displays the SMS screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields in the screen field according to the following description of Table 5-13 to execute a new test.

Table 5-13 [Manual Test: Stand-by] Screen GSM Mode Input Field

Input Field	Description
Measuring mode	Sets whether or not to execute each group of test items. Select `On` or `Off`. • Peak TX Power, Burst Timing, Power Ramp • Phase Error (RMS), Phase Error (Peak), Frequency Error • Sens/BER II, Sens/FER (Sens: sensitivity)
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 or PCS1900.

Table 5-13 [Manual Test: Stand-by] Screen GSM Mode Input Field

Input Field	Description
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
TCH *	Sets a traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Timing ADV	Sets a value for the timing advance ranging from `0` to `63` bits in `1` bit step.
Caller ID	Displays addresser number sent from the Tester at BS Call execution. The set value is displayed at this state.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from `-110.0` to `-50.0` dBm in `0.1` dB step. The default value is set on the [Configuration: Test Condition] screen.
Con Mode	Selects `Talk` or `Test`. • `Talk`: Loops back voice from the mobile phone until RF test is started. • `Test`: Transmits data (such as PN9, PN15, etc.) set in the **Data** field on the [Configuration: Test Condition] screen in the connection status.
Test Loop	Selects `Test Loop`, when `Con Mode` is set to Test. Test Loop A: BER measurement Test Loop C: Fast BER measurement
Averaging	Displays the average value of Peak TX Power, Phase Error, and Frequency Error. Sets the averaging number from `2` to `200`, or `Off`. When this function is not required, select `Off`.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The following measurement items are displayed in groups in the table. When a group of measurement items is selected with the CURSOR CONTROL knob, the Graph/Value screen for the group is displayed.

Table 5-14 Manual Test GSM Mode Measurement Item

Measurement Item	Description
Peak TX Power Burst Timing Power Ramp	Measurement results of Peak TX Power, Burst Timing and Power Ramp are shown. When this field is selected, the Graph/Value screen for **Peak TX Power/ Burst Timing/ Power Ramp** is displayed with the measurement results on text and graph display.
Phase Error (RMS) Phase Error (Peak) Frequency Error	Measurement results of Phase Error and Frequency Error are shown. When this field is selected, the Graph/Value screen for **Phase Error/ Frequency Error** is displayed with the measurement results on text and graph display.
Sens/BER II Sens/FER	Measurement results of Sensitivity/BER and Sensitivity/FER are shown. When this field is selected, the Graph/Value screen for **Sensitivity/ RX Quality/ RX Level** is displayed with the measurement results on text display.

The information from the mobile phone as Table 5-15 is displayed on the left side of the screen.

Table 5-15 [Manual Test: Stand-by] GSM Mode Screen Mobile Phone Information

Item Information	Description
IMSI	Displays the default value of International Mobile Subscriber Identity. The default value is `001012345678901`.
IMEI	This field remains blank at this state.
Caller ID	Displays addresser number sent from the Tester at BS Call execution. The set value is displayed at this state.
Dialed No.	This field remains blank at this state.
Power Class	This field remains blank at this state.
GSM Version	This field remains blank at this state.
RX Quality	This field remains blank at this field.
RX Level	This field remains blank at this field.
ACT Tim ADV	This field remains blank at this field.

The **RF On** indicator is displayed at the screen lower left corner only when the RF signal from the Tester is present at the RF IN/OUT connector.

Message Field

The following message is displayed in the message field on the [Stand-by] screen:

Press {Location Update}, {BS Call} or dial and call from the mobile.

The word surrounded by {} in the message field denotes the softkey.

Explanation

To start a test, turn the mobile phone on and wait for location update is passed automatically. **P** is shown on blue background at the test result cell of **Location Update** step when location update is passed.

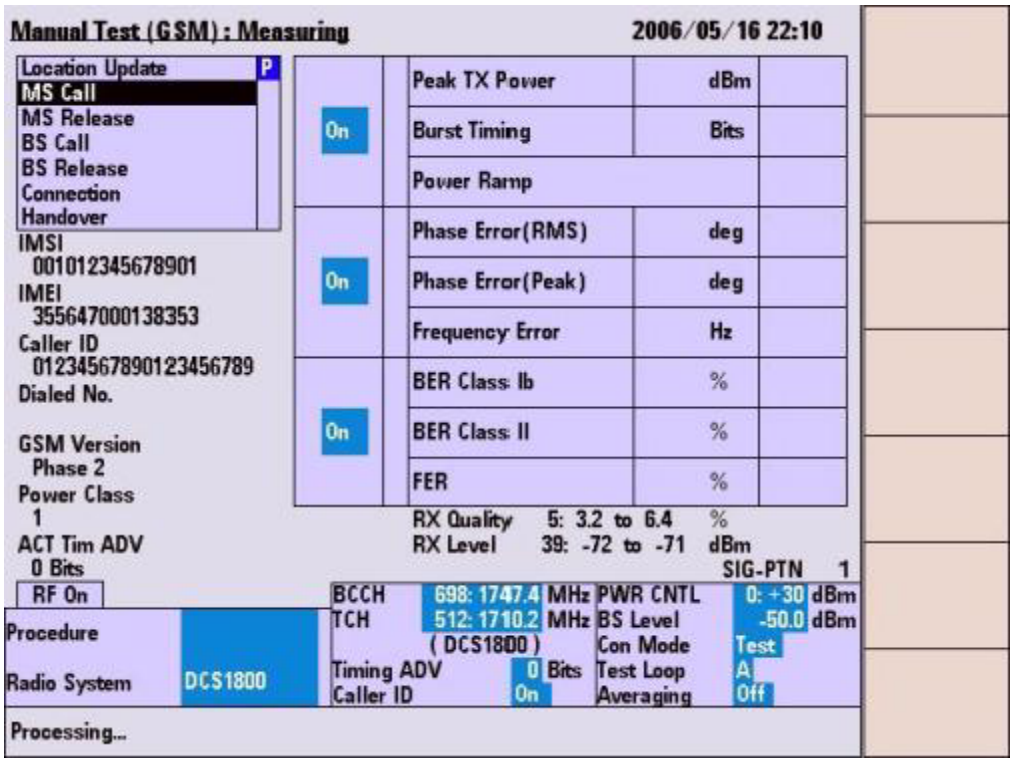
After that, there are two ways to continue the test process.

Press the **BS Call** softkey. The **BS Call** step is highlighted. Then, the following test result is shown in the test result field of the **BS Call** step.

- **P**: Shown on blue background when call setup is executed properly and BS Call is passed.
- **F**: Shown on red background when BS Call is failed.

Dial and press the **Off Hook** button on the mobile phone. The **MS Call** step is highlighted. Then, the following test result is shown in the test result field of the **MS Call** step.

Figure 5-30 [Manual Test: Measuring] MS Call Screen



The following test result is shown in the test result field of the **MS Call** step.

- **P**: Shown on blue background when a proper call setup is executed and MS Call is passed.
- **F**: Shown on red background when MS Call is failed.

When one of above procedure is performed, the screen changes from [Stand-by] screen to [Measuring] screen and a test starts.

Connection Screen

When call connection between the mobile phone and the Tester is succeeded, a [Measuring] connection screen as Figure 5-31 or Figure 5-32 is displayed.

If the trigger mode is set to `Cont`, continuous measurement of RF test starts as soon as a [Measuring] connection screen is displayed.

Until the measurement starts, the Tester loops back voice from the mobile phone.

Figure 5-31 [Measuring] BS Call Connection Screen

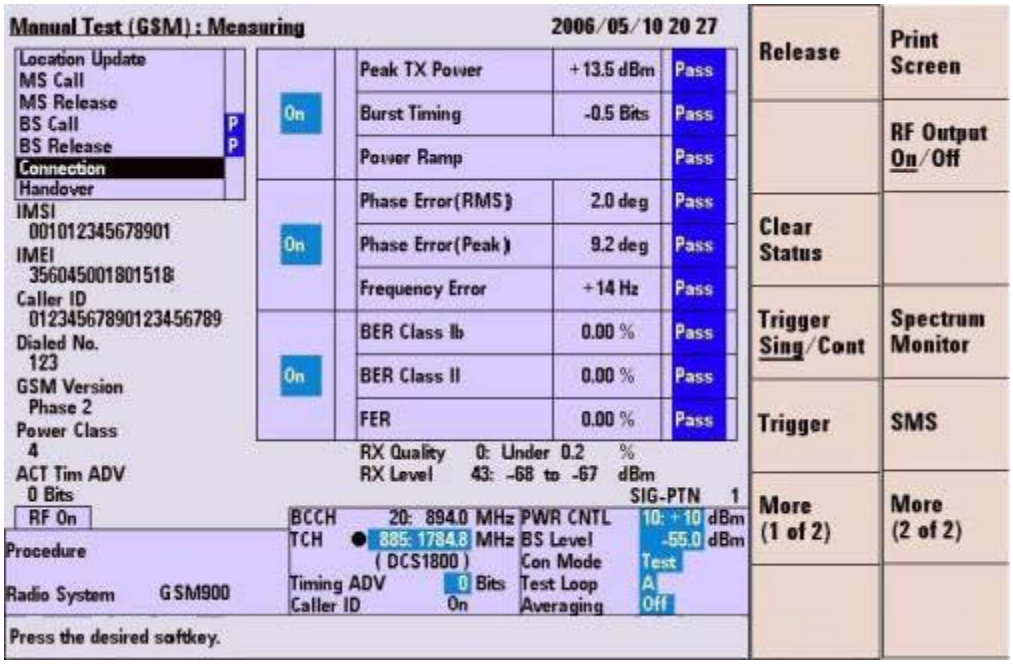
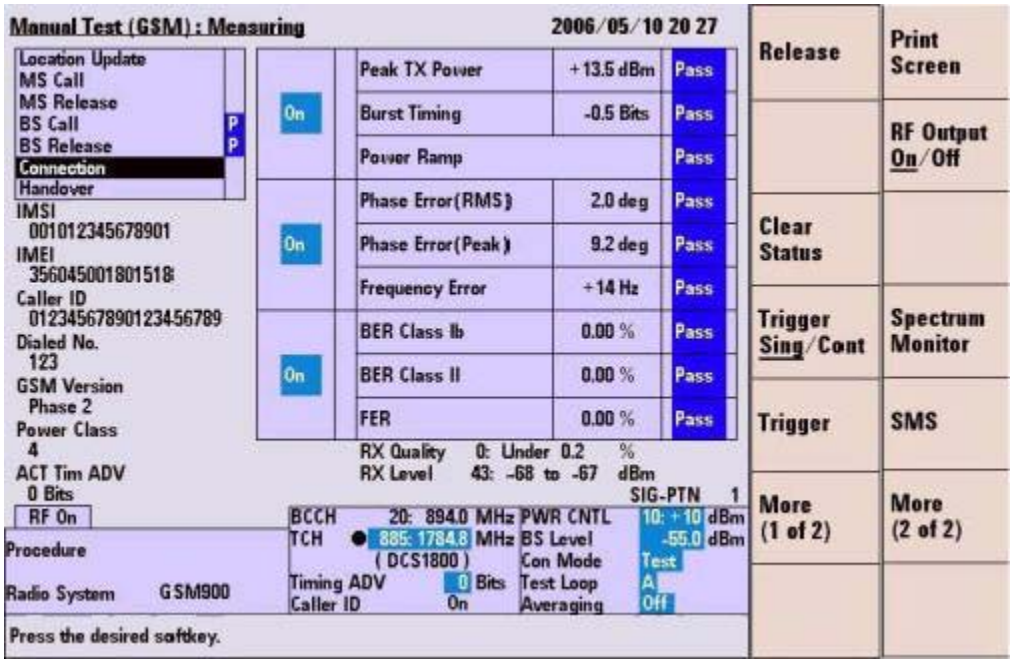


Figure 5-32 [Measuring] MS Call Connection Screen



Softkey Menu Field

Softkey Menu 1

- **Release**: Executes call Release from the Tester.
- **Clear Status**: Clears Pass/Fail results at signaling steps in the test flow.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement, change the trigger mode from `Sing` to `Cont`.
- **Trigger**: Starts single measurement.
- **More (1 of 2)**: Displays the softkey menu 2

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

The following input field in the screen field can be changed on the [Measuring] screens. Change the input fields according to Table 5-16.

Table 5-16 [Manual Test: Stand-by] Screen GSM Mode Input Field

Input Field	Description
Measuring mode	Sets whether or not to execute each group of test items. Select `On` or `Off`. • Peak TX Power, Burst Timing, Power Ramp • Phase Error (RMS), Phase Error (Peak), Frequency Error • Sens/BER II, Sens/FER (Sens: sensitivity)

Table 5-16 [Manual Test: Stand-by] Screen GSM Mode Input Field

Input Field	Description
TCH *	Sets a traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` If the channel number is changed in the **Connection** state, handover is executed.
Timing ADV	Sets a value for the timing advance ranging from `0` to `63` bits in `1` bit step.
Caller ID	Displays addresser number sent from the Tester at BS Call execution.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from `-110.0` to `-50.0` dBm in `0.1` dB step. The default value is set on the [Configuration: Test Condition] screen.
Con Mode	Selects `Talk` or `Test`. • `Talk`: Loops back voice from the mobile phone until RF test is started. • `Test`: Transmits data (such as PN9, PN15, etc.) set in the **Data** field on the [Configuration: Test Condition] screen in the connection status.
Test Loop	Selects `Test Loop`, when **Con Mode** is set to Test. Test Loop A: BER measurement Test Loop C: Fast BER measurement
Averaging	Displays the average value of Peak TX Power, Phase Error, and Frequency Error. Sets the averaging number from `2` to `200`, or `Off`. When this function is not required, select `Off`.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The information from the mobile phone as Table 5-17 is displayed on the left side of the screen.

Table 5-17 [Manual Test: Measuring] GSM Mode Connection Screen Mobile Phone Information

Item Information	Description
IMSI	Displays the International Mobile Subscriber Identity from the mobile phone.
IMEI	Displays the International Mobile station Equipment Identity from the mobile phone.

Table 5-17 [Manual Test: Measuring] GSM Mode Connection Screen Mobile Phone Information

Item Information	Description
Caller ID	Displays addresser number sent from the Tester at BS Call execution.
Dialed No.	Displays the number dialed from the mobile phone. If an emergency call is made, this field displays **Emergency Call**.
GSM Version	Displays either Phase 1 or Phase 2 defined by the mobile phone.
Power Class	Displays power class information of the mobile phone. Refer to Power Classes on page 2.
ACT Tim ADV	Displays the number of bits for the actual timing advance data.
RX Quality	Displays the measurement result for the received signal quality.
RX Level	Displays the measurement result for the received signal level.

Message Field

The following message is displayed in the message field on the Connection screens:

Press the desired softkey.

Measuring Screen

While BS Call or MS call is connected, RF test can be executed to measure the mobile phone before the call is released.

Figure 5-33 [Measuring] BS Call Screen

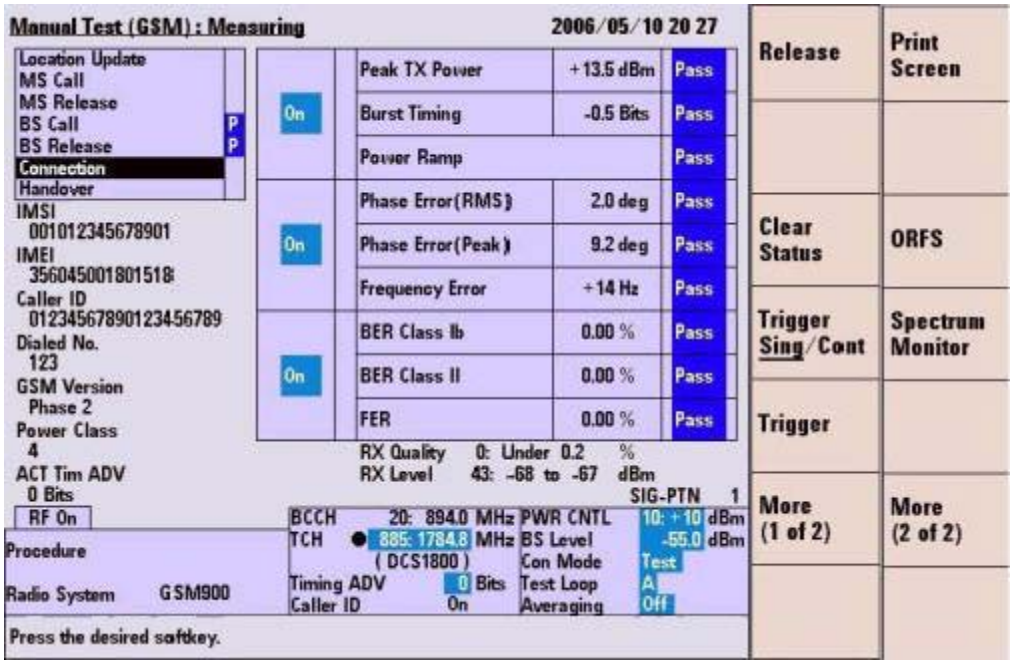
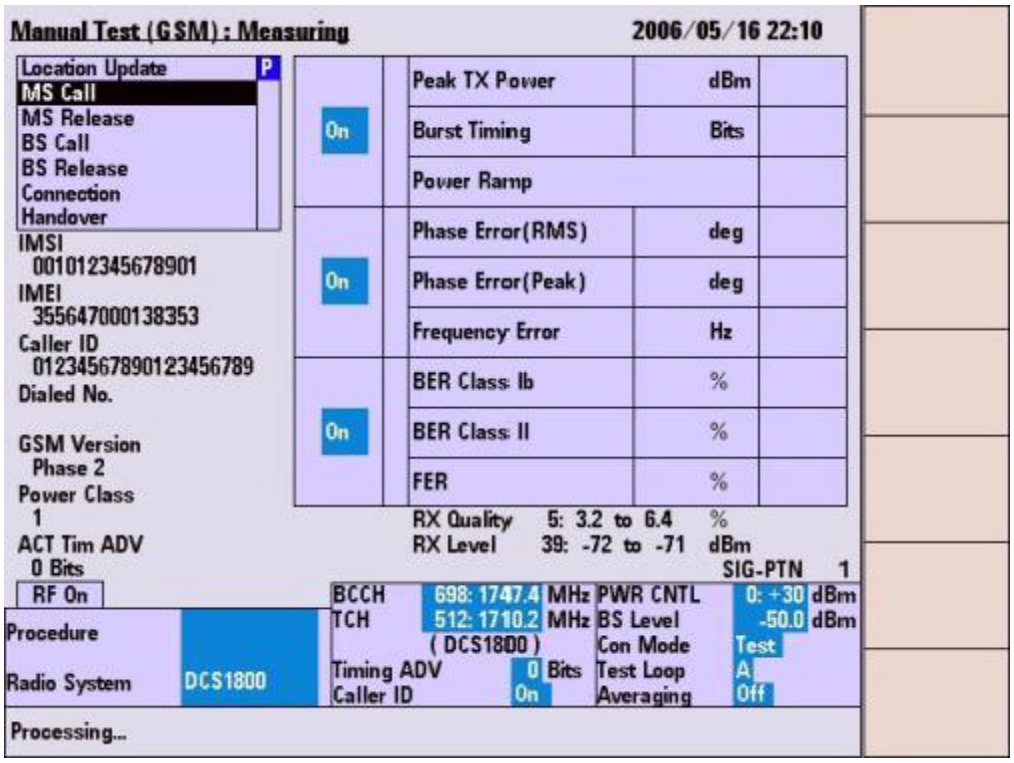


Figure 5-34 [Measuring] MS Call Screen



Softkey Menu Field

Softkey Menu

- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement. When the trigger mode is changed from `Sing` to `Cont`, continuous measurement starts.
  - The `Cont` mode setting provides continuous measurement.When the trigger mode is changed from `Cont` to `Sing`, the measurement is terminated.

Message Field

The following message is displayed in the screen field on [Measuring] screens:

Processing...

Summary Screen

When the measurement is completed, a [Measuring] summary screen showing measurement results is displayed.

- To end the measurement in BS Call connection, press the **Release** softkey to disconnect from the Tester.
- To end the measurement in MS Call connection, press the `On Hook` button on the mobile phone or the **Release** softkey to disconnect from the mobile phone.

When disconnecting the call is completed, a [Stand-by] summary screen as Figure 5-35 or Figure 5-36 is displayed.

- `Pass`: Shown on the blue background when the measurement is passed.
- `Fail`: Shown on the red background when the measurement is failed.

Figure 5-35 [Stand-by] BS Call Summary Screen

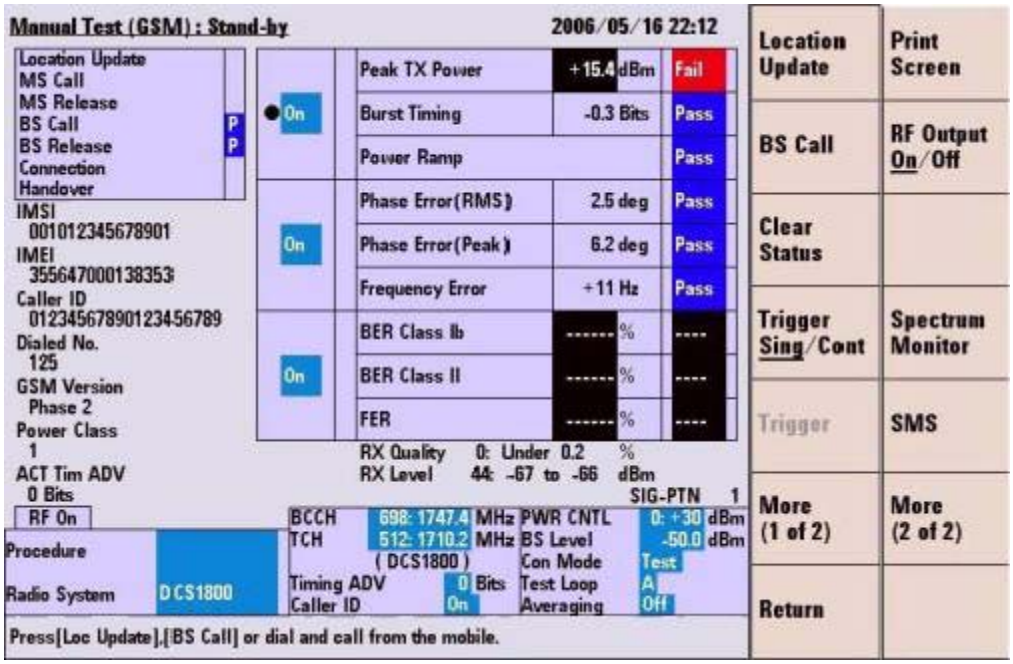
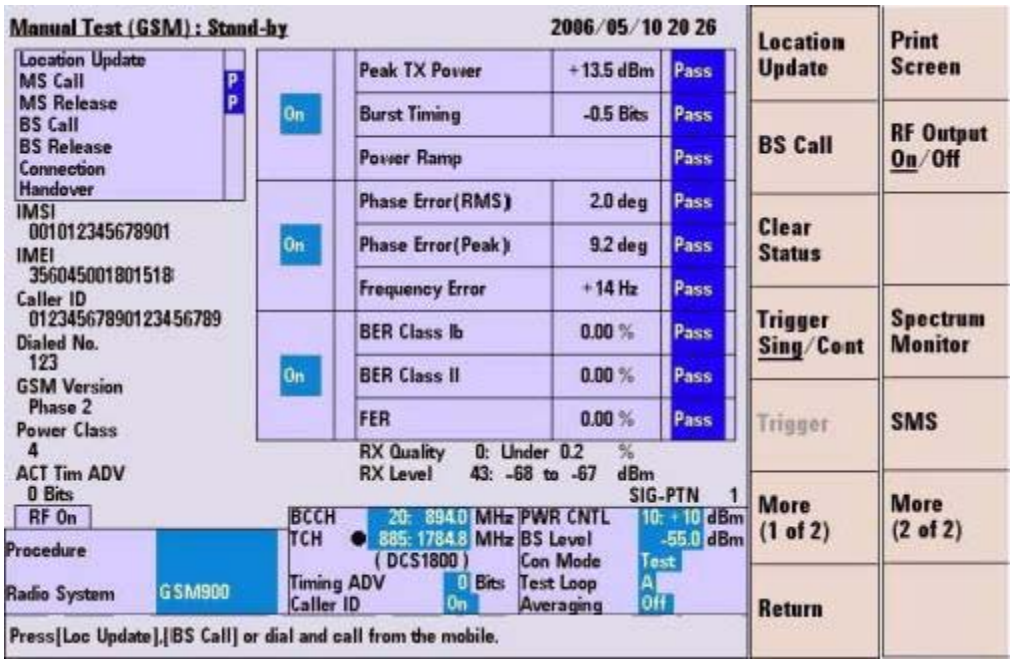


Figure 5-36 [Stand-by] MS Call Summary Screen



Softkey Menu Field

Softkey Menu 1

- **Location Update**: Executes the Location Update process for the Tester.
- **BS Call**: Executes BS Call.
- **Clear Status**: Clears Pass/Fail results at signaling steps in the test flow.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode provides single measurement in RF test.
  - The `Cont` mode provides continuous measurement in RF test.
- **Trigger**: Starts measurement in the connection status. This softkey is inactivated in the stand-by status but activated in the connection status.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **SMS**: Displays the SMS screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

The information in the screen field is displayed. Refer to Table 5-13 [Manual Test: Stand-by] Screen GSM Mode Input Field on page 47 and Table 5-17 [Manual Test: Measuring] GSM Mode Connection Screen Mobile Phone Information on page 54. The input field in the screen field can be changed for a new test.

Procedure to obtain a Graph/Value Screen

To obtain a Graph/Value from a [Stand-by] summary screen or a [Measuring] summary screen, follow the procedure described below.

Step 1

Place the cursor at one of the measurement items by rotating the CURSOR CONTROL knob.

Step 2

Selects the measurement item by pressing the CURSOR CONTROL knob.

Step 3

Either a measurement result list or a graph with a measurement result list is displayed according to each measurement item.

Measuring cannot be executed on the Graph/Value screen obtained from the [Stand-by] screen because the call connection between the mobile phone and the Tester is disconnected.

Graph/Value Screen

Peak TX Power/ Burst Timing/ Power Ramp

The measured data are shown in enlarged numerals.

The Power Ramp result is shown when the marker is placed at any point on its measured trace.

If the measured data exceeds the limits on the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-37[Measuring] Peak TX Power/Burst Timing/Power Ramp Screen

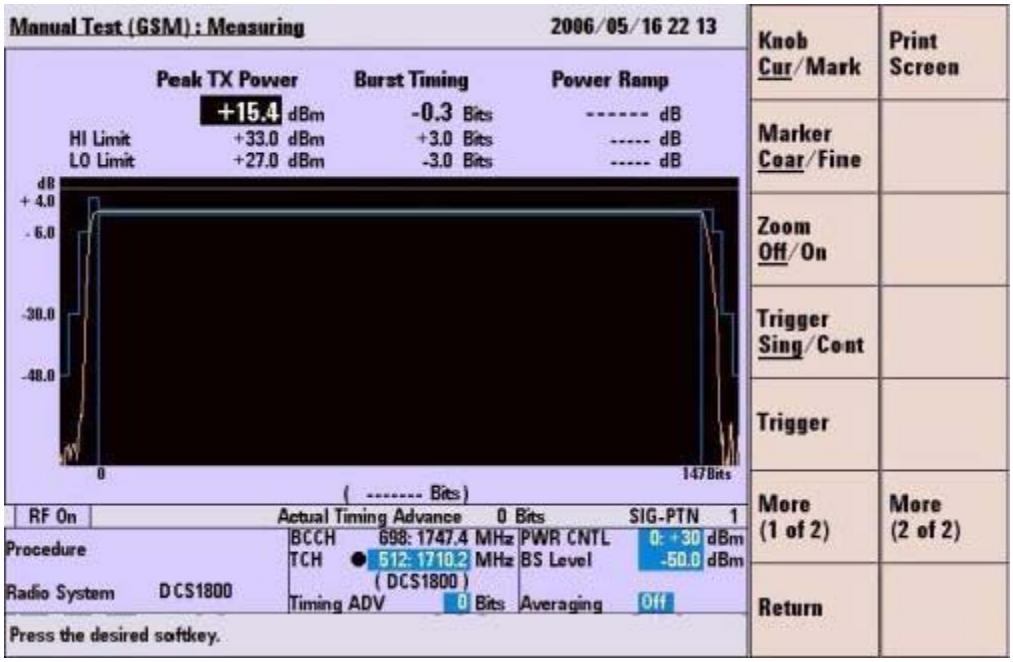
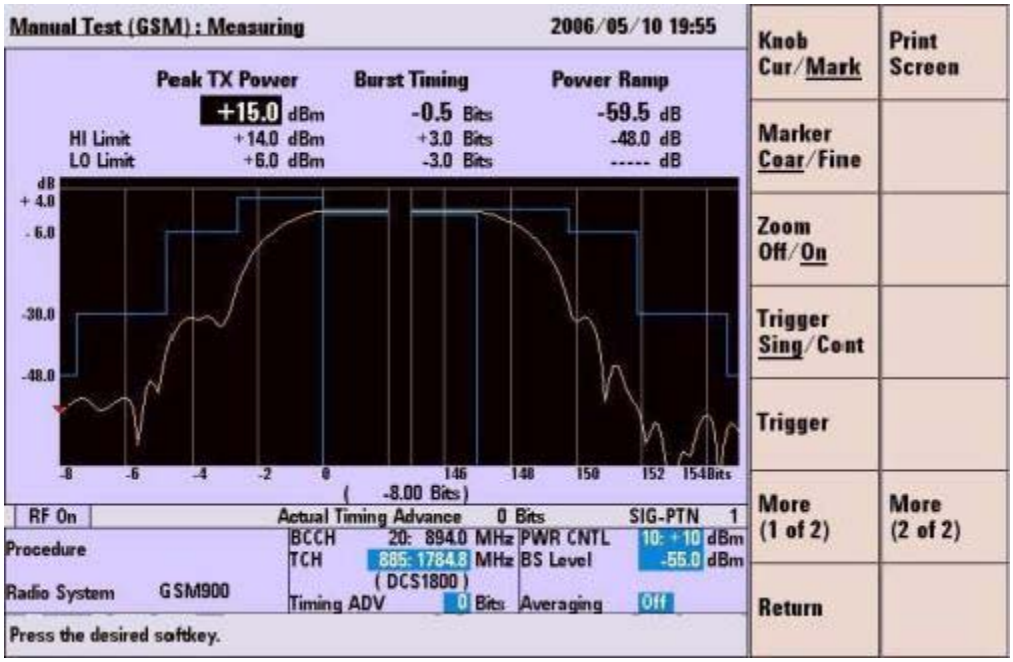


Figure 5-38[Measuring] Peak TX Power/ Burst Timing/ Power Ramp Zoomed Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob between `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the amplitude and timeslot (in bits) is available at any point of the measured trace.
- **Zoom Off/On**: Selects the zooming from `Off` and `On`. If `On` is selected, the rising edge, between `-8` bits and `0` bits, and trailing edge, between `147` and `155` bits, of the Power Ramp waveforms are expanded to observe the derailed test result as shown in Figure 5-38.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).

- The `Sing` mode setting provides single measurement.
- The `Cont` mode setting provides continuous measurement.
- To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
- To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
- This softkey is effective only for changing the trigger mode on the [Stand-by] screen.

- **Trigger**: Starts single measurement. This softkey is invalid on a [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen field

Set the input fields of the following parameters to execute a new test.

Table 5-18 [Manual Test: Stand-by] Screen GSM Mode Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on the [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 or PCS1900. This field cannot be changed on the [Measuring] screen.

Table 5-18 [Manual Test: Stand-by] Screen GSM Mode Input Field

Input Field	Description
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810 This field cannot be changed on the [Measuring] screen.
TCH *	Sets a traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
Timing ADV	Sets a value for the timing advance ranging from 0 to 63 bits in 1 bit step.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from -110.0 to -50.0 dBm in 0.1 dB step. The default value is set on the [Configuration: Test Condition] screen.
Averaging	Sets the averaging number from 2 to 99 or Off. When this function is not required, select Off.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

NOTE A Pass/Fail judgment is not given while transmission power is off.

The measurement results are shown in the screen field.

Table 5-19 [Manual Test] GSM Mode Peak TX Power/Burst Timing/Power Ramp Screen Field

Screen Field	Description
Peak TX Power	Measured Peak TX Power, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Table 5-19 [Manual Test] GSM Mode Peak TX Power/Burst Timing/Power Ramp Screen Field

Screen Field	Description
Burst Timing	Measured Burst Timing, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
Power Ramp	Measured Power Ramp, the HI and the LO Limit are shown. The limits are specified by the radio system selected (template).

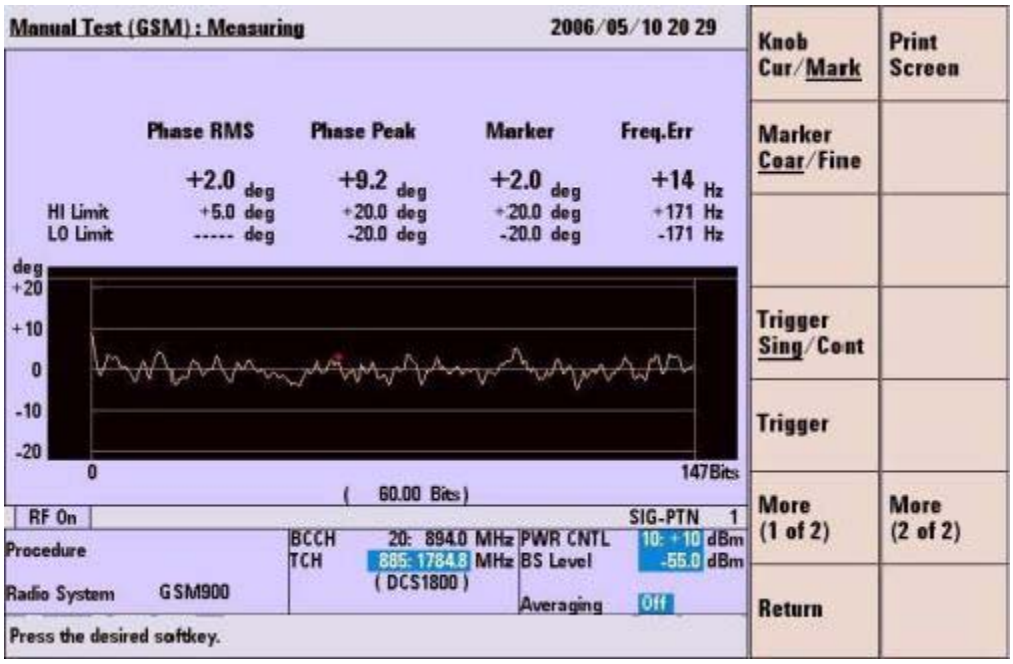
Phase Error/ Frequency Error

The RMS and Peak Phase Error and Frequency Error are shown along with the marker readout if the marker is activated.

If the measured data exceeds the limits in the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-39 [Measuring] Phase Error/ Frequency Error Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the phase error magnitude and timeslot (in bits) is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
  - To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
  - This softkey is effective only for changing the trigger mode on the [Stand-by] screen.
- **Trigger**: Starts single measurement. This softkey is inactivated on a [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-20 [Manual Test] GSM Mode Phase Error/Frequency Error Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on the [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 or PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810 This field cannot be changed on the [Measuring] screen.
TCH *	Sets a traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from -110.0 to -50.0 dBm in 0.1 dB step. The default value is set on the [Configuration: Test Condition] screen.
Averaging	Sets the averaging number from 2 to 99 or Off. When this function is not required, select Off.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement items are shown in the screen field.

Table 5-21 [Manual Test] GSM Mode Phase Error/Frequency Error Screen Field

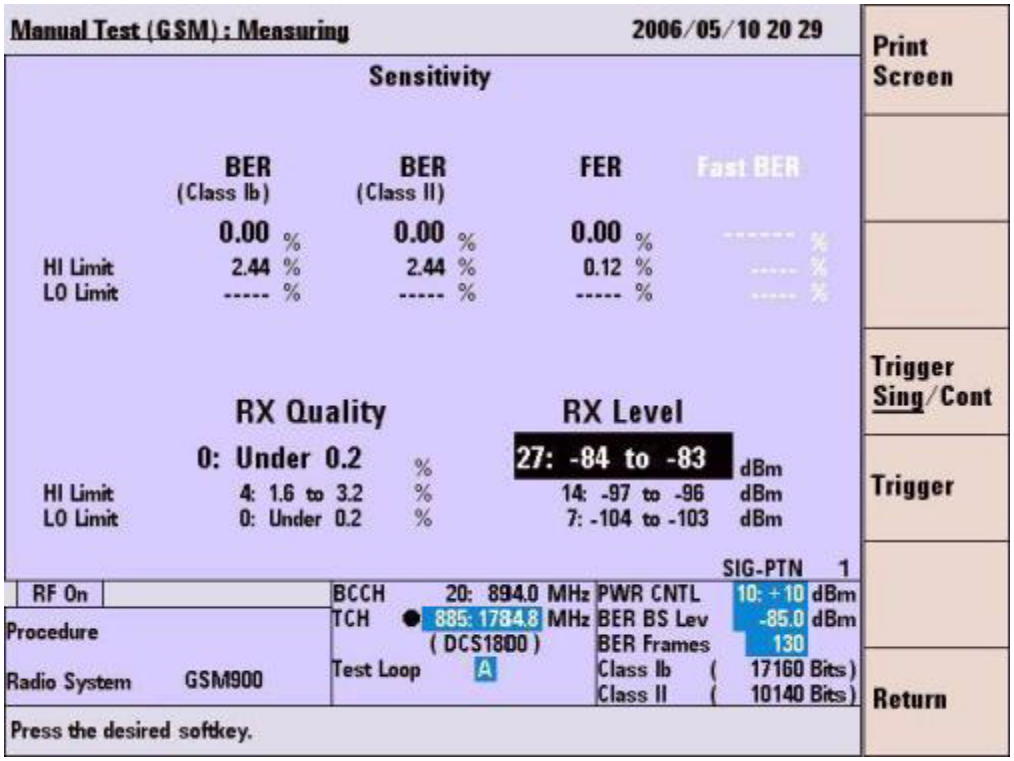
Screen Field	Description
RMS	Measured Phase Error (RMS) and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
Phase Peak	Measured Phase Error (Peak), the HI and the LO Limit are shown. A set of the HI and the LO Limit is set on the [Configuration: Test Condition] screen.
Marker	Measured Phase Error at the marker position, the HI and the LO Limit are shown. Measured data is shown when the marker is placed on the measurement trace. The HI Limit is set on the [Configuration: Test Condition] screen.
Frequency	Measured Frequency Error, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Sensitivity/ RX Quality/ RX Level

The measured data for BER, FER, RX Quality, and RX Level are shown as follows.

Any data indicating a failure is highlighted.

Figure 5-40 [Measuring] Sensitivity/ RX Quality/ RX Level Screen



Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
  - To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
  - This softkey is effective only for changing the trigger mode on the [Stand-by] screen.
- **Trigger**: Starts single measurement. This softkey is inactivated on a [Stand-by] screen.
- **Return**: Returns to the previous screen.

Screen Field

The input fields of the following parameters need to be set for a new test:

Table 5-22 [Manual Test] GSM Mode Sensitivity/ RX Quality/ RX Level Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on the [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 or PCS1900. This field cannot be changed on the [Measuring] screen.

Table 5-22 [Manual Test] GSM Mode Sensitivity/ RX Quality/ RX Level Screen Input Field

Input Field	Description
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810 This field cannot be changed on the [Measuring] screen.
TCH *	Sets a traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
Test Loop	Selects Test Loop, when **Con Mode** is set to Test. Test Loop A: Peak TX Power, Phase Error, Frequency Error, BER measurement Test Loop C: Peak TX Power, Phase Error, Frequency Error, Fast BER measurement
PWR CNTL *	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BER BS Lev *	Sets the RF output level of the Tester, ranging from -110.0 to -50.0 dBm in 0.1 dB step.
BER Frames * (Test Loop A) Fast BER Frames * (Test Loop C)	Sets the number of test frames for BER and Fast BER measurement. The allowable range is from 1 to 13000 in 1 step. BER Frames: displays the number of test bits of the Class1b and Class II. Fast BER Frames: displays the number of test bits of the Fast BER Class1b: The number of test bits, derived from an equation **BER Frames multiplied by 78 bits**, is displayed. Fast BER: The number of test bits, derived from an equation **BER Frames multiplied by 456 bits**, is displayed.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement results are shown in the screen field.

Table 5-23 [Manual Test] GSM Mode Sensitivity/RX Quality/RX Level Screen Field

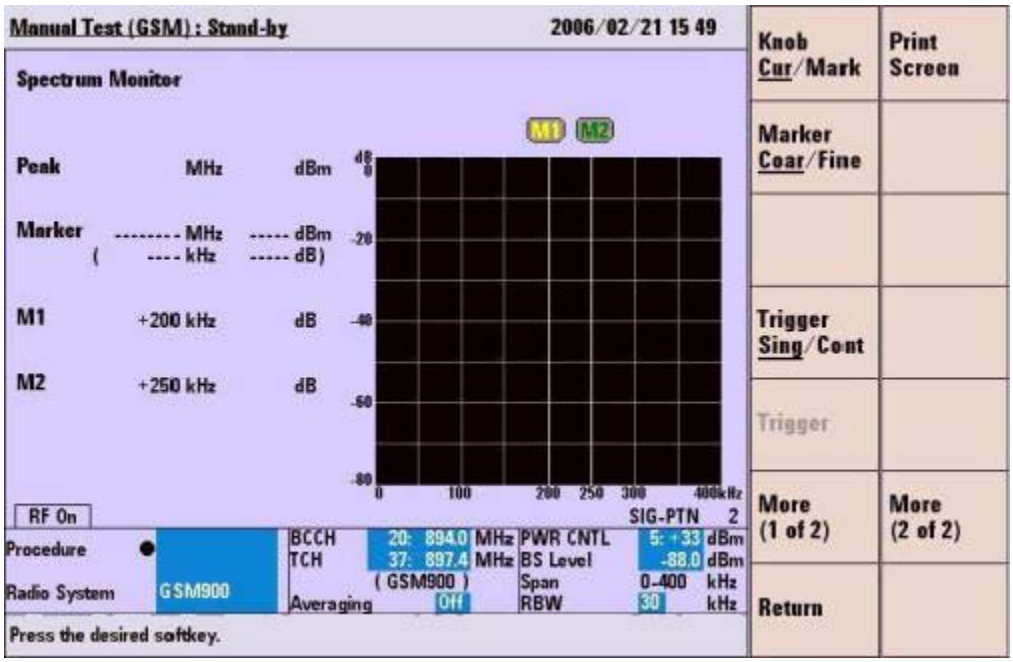
Screen Field	Description
BER (Class Ib) (Test Loop A)	Measured BER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
BER (Class II) (Test Loop A)	Measured BER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
FER (Test Loop A)	Measured FER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
Fast BER (Test Loop C)	Measured Fast BER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
RX Quality	RX Quality measured with the mobile phone, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
RX Level	RX Level measured with the mobile phone, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Spectrum Monitor

The RF spectrum of the traffic channel can be measured by Spectrum Monitor.

The spectrum, which is measured from f_c to f_c + 400 kHz relative to the traffic channel frequency, is shown with readouts at +200kHz (M1) and +250kHz (M2) offsets.

Figure 5-41 [Measuring] Spectrum Monitor Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the frequency and amplitude is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.

- To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
- This softkey is effective only for changing the trigger mode on the [Stand-by] screen.

- **Trigger**: Starts single measurement. This softkey is inactivated on a [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous summary screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-24 [Manual Test] GSM Mode Spectrum Monitor Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on the [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 or PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` This field cannot be changed on the [Measuring] screen.

Table 5-24 [Manual Test] GSM Mode Spectrum Monitor Screen Input Field

Input Field	Description
TCH *	Sets a traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Averaging	Sets the averaging number from `2` to `99` or `Off`. When this function is not required, select `Off`.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from `-110.0` to `-50.0` dBm in `0.1` dB step. The default value is set on the [Configuration: Test Condition] screen.
RBW	Selects `10` kHz or `30` kHz resolution bandwidth as follows: `10`: Sets the resolution bandwidth to 10kHz. `30`: Sets the resolution bandwidth to 30kHz.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement results as Table 5-25 is displayed:

Table 5-25 [Manual Test] GSM Mode Sensitivity/RX Quality/RX Level Screen Field

Screen Field	Description
Peak	The absolute peak power and frequency are shown.
Marker *	The readout of frequency and amplitude at the marker position is shown as follows when the marker is activated by the **Knob Cur/Marker** softkey setting: • —— MHz —— dBm: The absolute frequency and amplitude at the marker position are shown. • (—— kHz —— dB): The relative frequency and amplitude at the marker position are shown.
M1: +200kHz M2: +250kHz	The amplitudes at +200 kHz and +250 kHz offsets relative to the traffic channel frequency are also shown.

* The resolution of the marker on the screen is not equivalent to the measurement resolution.

Message Field

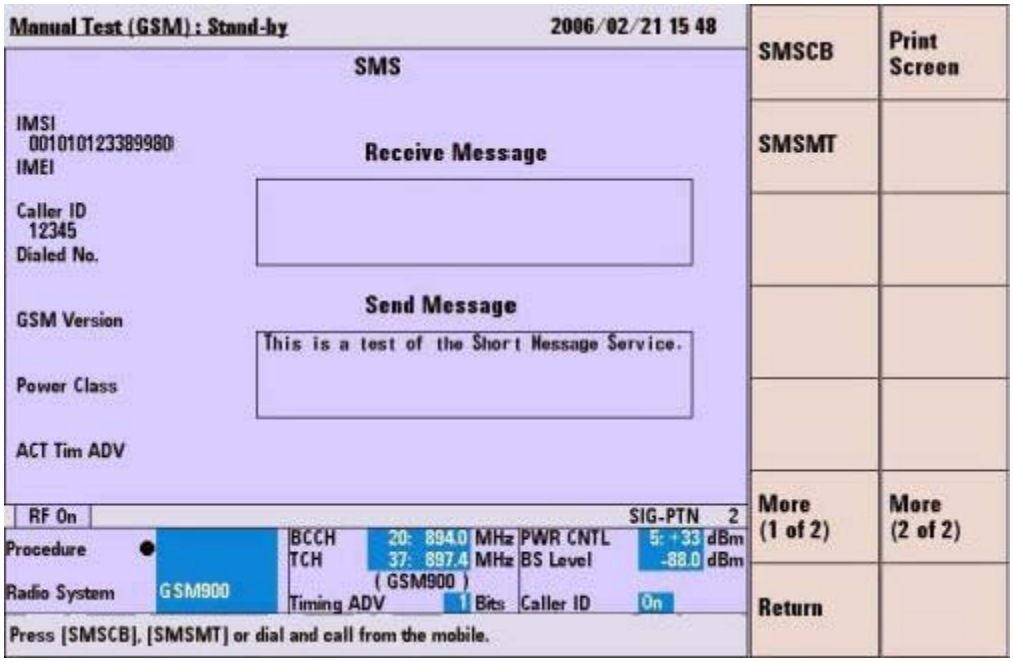
The following message is displayed in the message field:

Press the desired softkey.

SMS Screen

After completion of the Location Update process in the GSM mode, press the **SMS** softkey in the softkey menu 2 on the [Manual Test: Stand-by] screen to display the SMS screen as Figure 5-42 for testing SMS function.

Figure 5-42 [Stand-by] SMS Screen



Softkey Menu Field

Softkey Menu 1

- **SMSCB**: Starts the cell broadcast of short messages. The number of sendable characters is up to 93 characters (ASCII).
- **SMSMT**: Transmits the messages from the Tester. The number of sendable characters is up to 160 characters (ASCII).
- **More (1 of 2)**: Displays the softkey menu 2.

- **Return**: Returns to the [Stand-by] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields in the screen field according to the following description of Table 5-26 to execute a new test.

Table 5-26 [Manual Test] GSM Mode SMS Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 or PCS1900.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
TCH *	Sets a traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
Timing ADV *	Sets a value for the timing advance ranging from 0 to 63 bits in 1 bit step.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.

Table 5-26 [Manual Test] GSM Mode SMS Screen Input Field

Input Field	Description
BS Level *	Sets the RF output level of the Tester, ranging from `-110.0` to `-50.0` dBm in `0.1` dB step. The default value is set on the [Configuration: Test Condition] screen.
Caller ID	Displays addresser number sent from the Tester at BS Call execution. The set value is displayed at this state.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The data and the message from/to the mobile phone are shown in this field.

Table 5-27 [Manual Test] GSM Mode SMS Information

Item Information	Description
IMSI	Displays the International Mobile Subscriber Identity from the mobile phone.
IMEI	Displays the International Mobile station Equipment Identity from the mobile phone.
Caller ID	Displays addresser number sent from the Tester at BS Call execution.
Dialed No.	Displays the number dialed from the mobile phone.
GSM Version	Displays either Phase 1 or Phase 2 defined by the mobile phone.
Power Class	Displays power class information of the mobile phone. Refer to Power Classes on page 2.
ACT Tim ADV	Displays the number of bits for the actual timing advance data.
Receive Message	Displays the message received from the mobile phone. The number of received characters is up to 160 characters (ASCII).
Send Message	Displays the message sent to the mobile phone. The number of sendable characters is up to 160 characters (ASCII).

NOTE Remote Control application (provided by user) is required to change the Send Message.

Message Field

The following message is displayed in the message field:

Press {SMSCB}, {SMSMT}, or dial and call from the mobile.

The word surrounded by {} in the message field demotes the softkey.

Explanation

- **SMSMO**: Send a message from the mobile phone, and then the message is displayed in the **Receive Message** field on the screen.
- **SMSCB**: Press the **SMSCB** softkey to send the message in the **Send Message** field on the screen from the Tester to the mobile phone using call broadcast function.
- **SMSMT**: Press the **SMSMT** softkey to send the message in the **Send Message** field on the screen from the Tester to the mobile phone.

Manual Test (GPRS Mode)

Description of GPRS System

The General Packet Radio Service (GPRS) is a GSM data service which is capable to provide mobile phone users with higher data transfer rates over the public switched telephone network (PSTN).

The system can transfer data in packet over the air interface, and uses existing TCP/IP protocols to mate with the Internet and other data networks.

Feature of Manual Test GPRS Mode

All test items are executed while the mobile phone and the Tester are connected by call control protocol.

Setting for Manual Test GPRS Mode in the Configuration Mode

- Loss:

The path loss value for each radio system can be set on the [Configuration] screen to correct the RF attenuation between the mobile phone and the Tester.

- Limits of measurement items:

Each measurement item can be measured and analyzed with the measurement limits set on the [Configuration: Test Condition] screen.

Slot Configuration and Measurement Slot

The combination of the slot configuration and the order of measurement slot are follows:

Table 5-28 Slot Configuration and Measurement Slot

Slot Configuration	Measurement Slot
1×1	2
2×1, 3×1	3
2×2	2 or 3
3×2	3 or 4
4×1	4

NOTE

For numeric value entry, the changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13. The default state is the last setting stored in the internal memory of the Tester before power off.

Test SIM

Insert the Test SIM provided by Agilent in the mobile phone before performing any test because the Tester will not be able to perform measurements with a SIM that is provided by cell phone operator or other Test SIMs.

Stand-by Screen

When the GPRS is selected in the **GSM mode** from the [Configuration: Test Condition] screen, the following [Manual Test: Stand-by] screen is displayed.

Slot Config and **Measurement Slot** fields are additionally available for GPRS measurements.

Figure 5-43 [Manual Test: Stand-by] GPRS Mode Screen

Softkey Menu Field

Softkey Menu 1

- **Clear Status**: Clears Pass/Fail results at signaling steps in the test flow.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode provides single measurement in RF test.
  - The `Cont` mode provides continuous measurement in RF test.
  - **Trigger**: Starts single measurement in the attached status. This softkey is invalid in the Stand-by status but activated in the attached status.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Fields

Set the input fields on the screen field according to the following description of Table 5-29 to execute a new test.

Table 5-29 [Manual Test: Stand-by] GPRS Mode Screen Input Field

Input Field	Description
Measuring mode	Sets whether or not to execute test items or each group of test items. Select `On` or `Off`. • Peak TX Power, Burst Timing, Power Ramp • Phase Error (RMS), Phase Error (Peak), Frequency Error • Sensitivity/BLER
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 or PCS1900.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Coding Scheme	Sets the Coding Scheme of PDTCH data (up and down). Selects from CS1 to CS4. Attach: Up/Down CS1: fixed
Averaging	Displays the average value of Peak TX Power, Phase Error, and Frequency Error. Sets the averaging number from `2` to `200`, or `Off`. When this function is not required, select `Off`.

Table 5-29 [Manual Test: Stand-by] GPRS Mode Screen Input Field

Input Field	Description
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from `-110.0` to `-50.0` dBm in `0.1` dB step. The default value is set on the [Configuration: Test Condition] screen.
Slot Config	Selects 1×1, 2× 1, 2×2, 3×1, 3×2, or 4×1
Measur Slot	When the **Slot Config** is set to 2×2 or 3×2, this field becomes a settable field. Selects measurement slot from 2 to 4 depending on the setting of the **Slot Config**.
Test Mode	Selects from ACK, A, or B. ACK: Measurement of Peak TX Power, Phase Error, Frequency Error, and BLER A: Measurement of Peak TX Power, Phase Error, and Frequency Error B: Measurement of Peak TX Power, Phase Error, Frequency Error and BER. Active in Unacknowledged Mode for UL/DL.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The following measurement items are displayed in groups in the table. When a group of measurement items is selected with the CURSOR CONTROL knob, the Graph/Value screen for each group is displayed.

Table 5-30 Manual Test GPRS Mode Measurement Item

Measurement Item	Description
Peak TX Power Burst Timing Power Ramp	Measurement results of Peak TX Power, Burst Timing and Power Ramp are shown. When this field is selected, the Graph/Value screen for **Peak TX Power/ Burst Timing/ Power Ramp** is displayed with measurement results on text and graph display. If the marker function is active, the Power Ramp value is displayed according to the marker position.
Phase Error (RMS) Phase Error (Peak) Frequency Error	Measurement results of Phase Error and Frequency Error are shown. When this field is selected, the Graph/Value screen for **Phase Error/ Frequency Error** is displayed with measurement results on text and graph display.
BLER (Test Mode: ACK) BER (Test Mode: B)	Measurement result of BLER and BER is shown. When this field is selected, the Graph/Value screen for **Sensitivity** is displayed with measurement result on text display.

The information from the mobile phone is displayed on the left side of the screen:

Table 5-31 Manual Test GPRS Mode Measurement Item

Item Information	Description
IMSI	Displays the default value of International Mobile Subscriber Identity. The default value is 001012345678901.
IMEI	This field remains blank at this state.
Multislot Class	This field remains blank at this state.
RF Power Capability	This field remains blank at this state.

The **RF On** indicator is displayed at the lower left side corner of the screen only when the RF signal from the Tester is present at the RF IN/OUT connector.

Message Field

The following message is displayed on the [Stand-by] screen:

Press the desired softkey.

Explanation

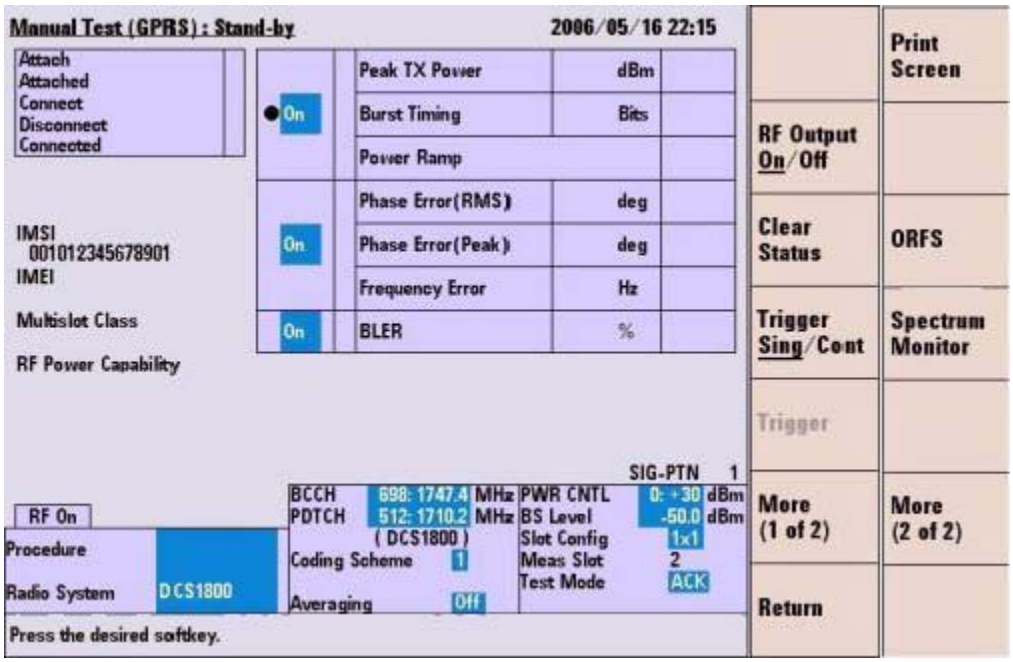
To start a test, turn the mobile phone on and wait for the **Attach** step is passed. After that, the [Manual Test: Measuring] Attached screen is displayed.

Attached Screen

After completion of the attaching process, the [Measuring] screen as Figure 5-44 is displayed.

The **Attached** step in the test flow field is highlighted and **P** is shown at the test result cell for the **Attach** step.

Figure 5-44 [Measuring] Attached Screen



Softkey Menu Field

Softkey Menu 1

- **End**: Starts the detach process.
- **Clear Status**: Clears Pass/Fail results at signaling steps in the test flow.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode provides single measurement.
  - The `Cont` mode provides continuous measurement.
  - To start continuous measurement, change the trigger mode from `Sing` to `Cont`.
- **Trigger**: Starts single measurement.
- **More (1 of 2)**: Displays the softkey menu 2.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

The following input field can be changed on the [Measuring] screen. Change the input fields according to Table 5-32.

Table 5-32 [Manual Test: Measuring] GPRS Mode Screen Input Field

Input Field	Description
Measuring mode	Sets whether or not to execute test items or each group of test items. Select `On` or `Off`. • Peak TX Power, Burst Timing, Power Ramp • Phase Error (RMS), Phase Error (Peak), Frequency Error • Sensitivity/BLER
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Coding Scheme	Sets the Coding Scheme of PDTCH data (up and down). Selects from CS1 to CS4. Attach: Up/Down CS1: fixed
Averaging	Displays the average value of Peak TX Power, Phase Error, and Frequency Error. Sets the averaging number from `2` to `200`, or `Off`. When this function is not required, select `Off`.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from `-110.0` to `-50.0` dBm in `0.1` dB step. The default value is set on the [Configuration: Test Condition] screen.
Slot Config	Selects 1×1, 2× 1, 2×2, 3×1, 3×2, or 4×1

Table 5-32 [Manual Test: Measuring] GPRS Mode Screen Input Field

Input Field	Description
Measur Slot	When the **Slot Config** is set to 2×2 or 3×2, this field becomes a settable field. Selects measurement slot from 2 to 4 depending on the setting of the **Slot Config**.
Test Mode	Selects from ACK, A, or B. ACK: Measurement of Peak TX Power, Phase Error, Frequency Error, and BLER A: Measurement of Peak TX Power, Phase Error, and Frequency Error B: Measurement of Peak TX Power, Phase Error, Frequency Error and BER. Active in Unacknowledged Mode for UL/DL.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The information from the mobile phone is displayed on the left side of the screen.

Table 5-33 [Manual Test] GPRS Mode Attached Screen Mobile Phone Information

Item Information	Description
IMSI	Displays the International Mobile Subscriber Identity from the mobile phone.
IMEI	Displays the International Mobile station Equipment Identity from the mobile phone.
Multislot Class	Displays the Multislot Class of the Mobile phone, ranging from `1` to `12`.
RF Power Capability	Displays the power class for each Radio System, ranging from `1` to `5`.

Message Field

The following message is displayed in the message field on the [Measuring] screen:

Press the desired softkey.

Explanation

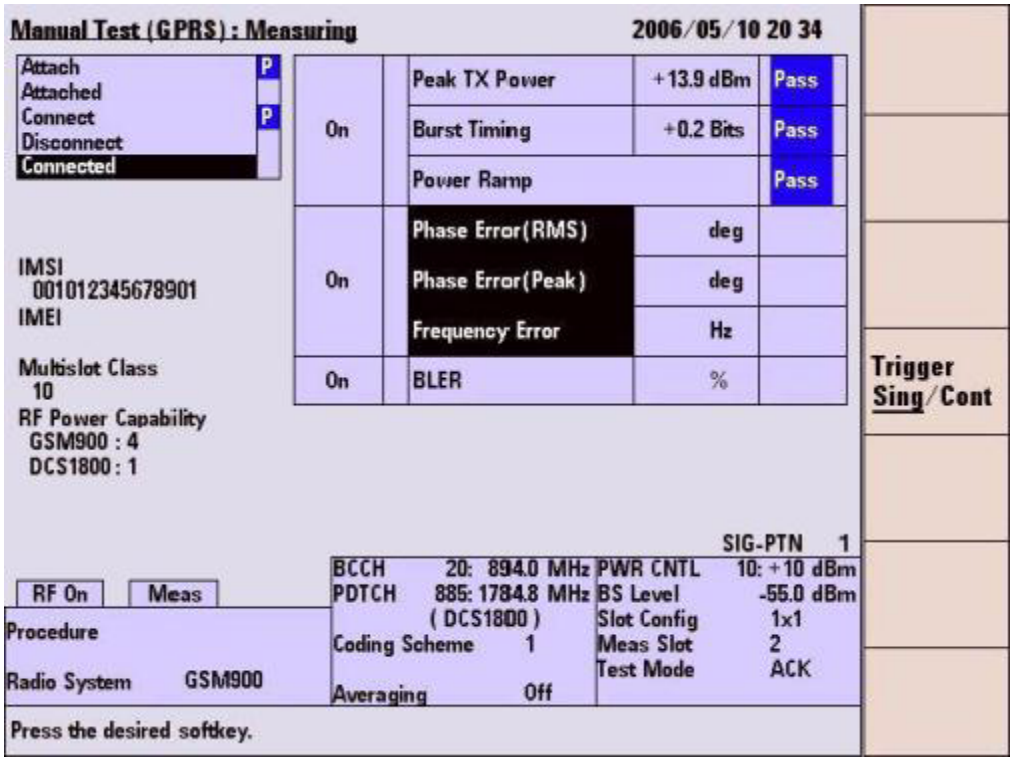
The **Connect** process starts and measurement is executed with the following ways:

- Press the **Trigger** softkey to execute single measurement.
- Press the **Trigger Sing/Cont** softkey to change the trigger mode from `Sing` to `Cont` in order to execute continuous measurement.

Connected Screen

When measurement starts, the [Measuring] connected screen as Figure 5-45 is displayed.

Figure 5-45 [Measuring] Connected Screen



Softkey Menu Field

Softkey Menu

- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement. When the trigger mode is changed from `Sing` to `Cont`, the continuous measurement starts.
  - The `Cont` mode setting provides continuous measurement. When the trigger mode is changed from `Cont` to `Sing`, the measurement is terminated.

Summary Screen

After completion of the measurement in the **Connected** step, the disconnect process starts, and then a [Measuring] summary screen showing measurement results is automatically displayed.

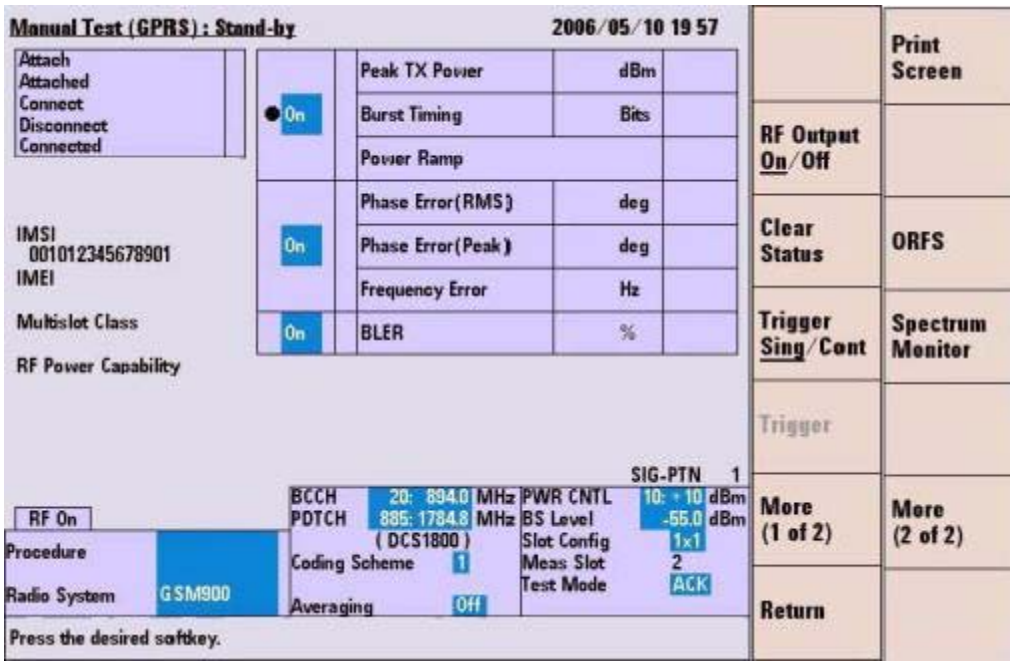
To end the measurement in the attached status, press the **End** softkey to start the detach process.

When the detach process is completed, a [Stand-by] summary screen as Figure 5-46 is displayed.

A measurement result and Pass/Fail result are shown right next to each measurement item.

- `Pass`: Shown on blue background when the measurement is passed.
- `Fail`: Shown on red background when the measurement is failed.

Figure 5-46 [Stand-by] Summary Screen



Softkey Menu Field

Softkey Menu 1

- **Clear Status**: Clears Pass/Fail results at signaling steps in the test flow.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode provides single measurement in RF test.
  - The `Cont` mode provides continuous measurement in RF test.
- **Trigger**: Starts measurement in the attached status. This softkey is invalid in the Stand-by status but activated in the attached status.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

The information in the screen field is displayed. Refer to Table 5-29 [Manual Test: Stand-by] GPRS Mode Screen Input Field on page 81 and Table 5-33 [Manual Test] GPRS Mode Attached Screen Mobile Phone Informationon page 86. The input field in the screen field can be changed for a new test.

Procedure to obtain a Graph/Value screen

To obtain a Graph/Value from the [Stand-by] summary screen or the [Measuring] summary screen, follow the procedure described below.

Step 1

Place the cursor at one of the test items by rotating the CURSOR CONTROL knob.

Step 2

Select the test item by pressing the CURSOR CONTROL knob.

Step 3

Either a measurement result list or a graph with a measurement result list is displayed according to each measurement item.

Measuring cannot be executed on the Graph/Value screen obtained from the [Stand-by] screen because the call connection between the mobile phone and the Tester is disconnected.

Graph/Value Screen

Peak TX Power/ Burst Timing/ Power Ramp

The measured data are shown in enlarged numerals.

The Power Ramp result is shown when the marker is placed at any point on its measured trace.

If the measured data exceeds the limits on the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-47[Measuring] Peak TX Power/ Burst Timing/ Power Ramp Screen

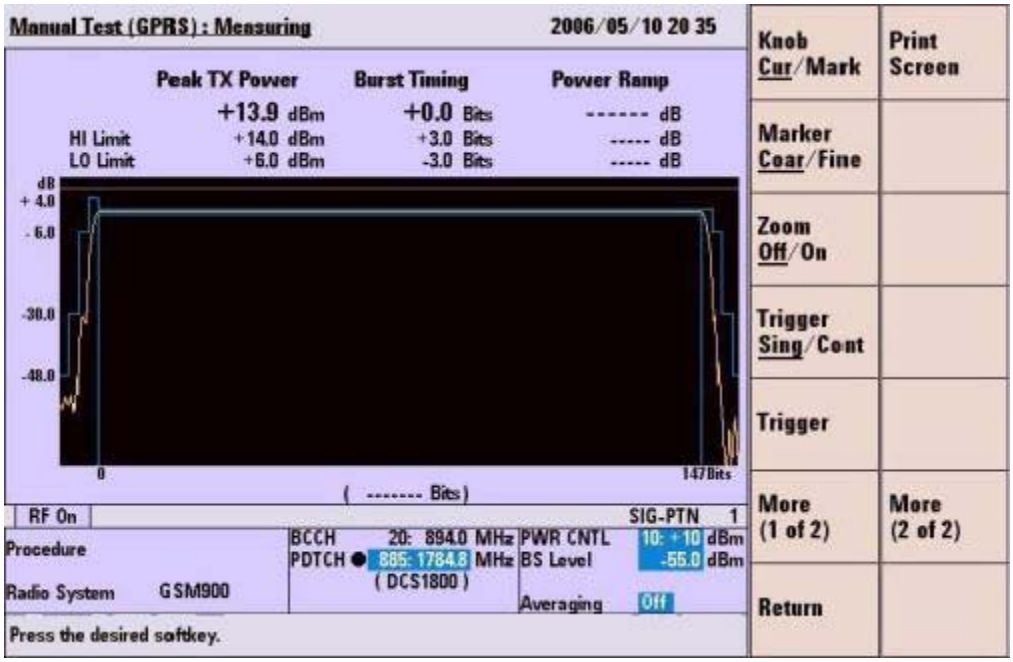
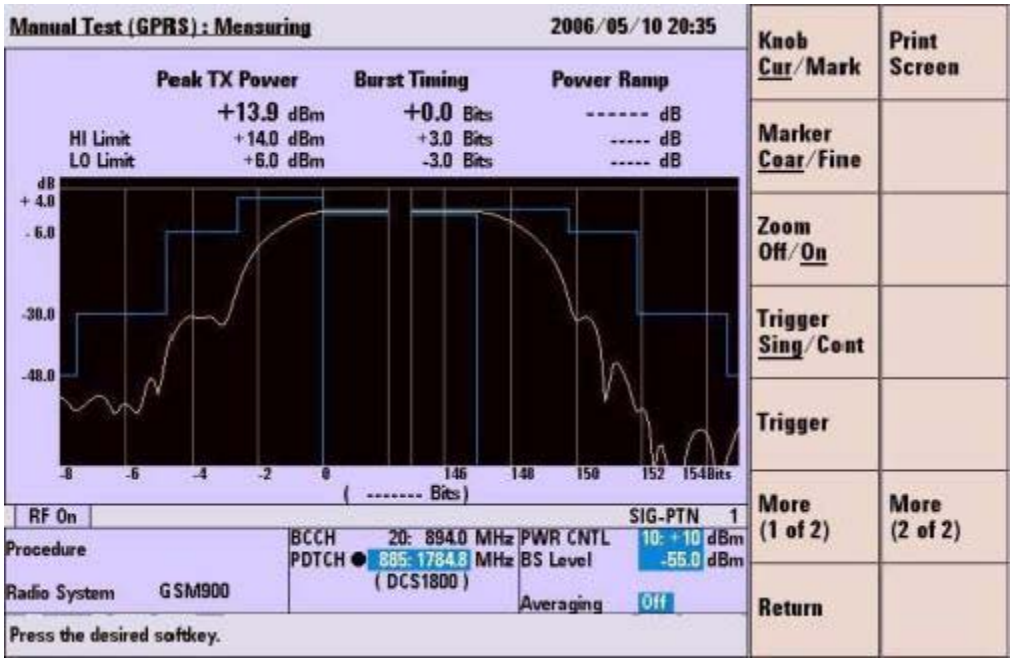


Figure 5-48[Measuring] Peak TX Power/ Burst Timing/ Power Ramp Zoomed Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the amplitude and timeslot (in bits) is available at any point of the measured trace.
- **Zoom Off/On**: Toggles the zooming function between `Off` and `On`. If `On` is selected, the rising edge, between `-8` bits and `0` bits, and trailing edge, between `147` and `155` bits, of the Power Ramp waveforms are expanded to observe the derailed test result as shown in Figure 5-48.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
  - To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
  - This softkey is effective only for changing the trigger mode on the [Stand-by] screen.
- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-34 [Manual Test] GPRS Mode Peak TX Power/ Burst Timing/Power Ramp Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on a [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810 This field cannot be changed on the [Measuring] screen.
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.

Table 5-34 [Manual Test] GPRS Mode Peak TX Power/ Burst Timing/Power Ramp Screen Input Field

Input Field	Description
BS Level *	Sets the RF output level of the Tester, ranging from `-110.0` to `-50.0` dBm in `0.1` dB step. The default value is set on the [Configuration: Test Condition] screen.
Averaging *	Sets the averaging number from `2` to `99` or `Off`. When this function is not required, select `Off`.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

NOTE A Pass/Fail judgment is not given while transmission power is off.

The measurement results are shown in the screen field.

Table 5-35 [Manual Test] GPRS Mode Peak TX Power/Burst Timing/Power Ramp Screen Field

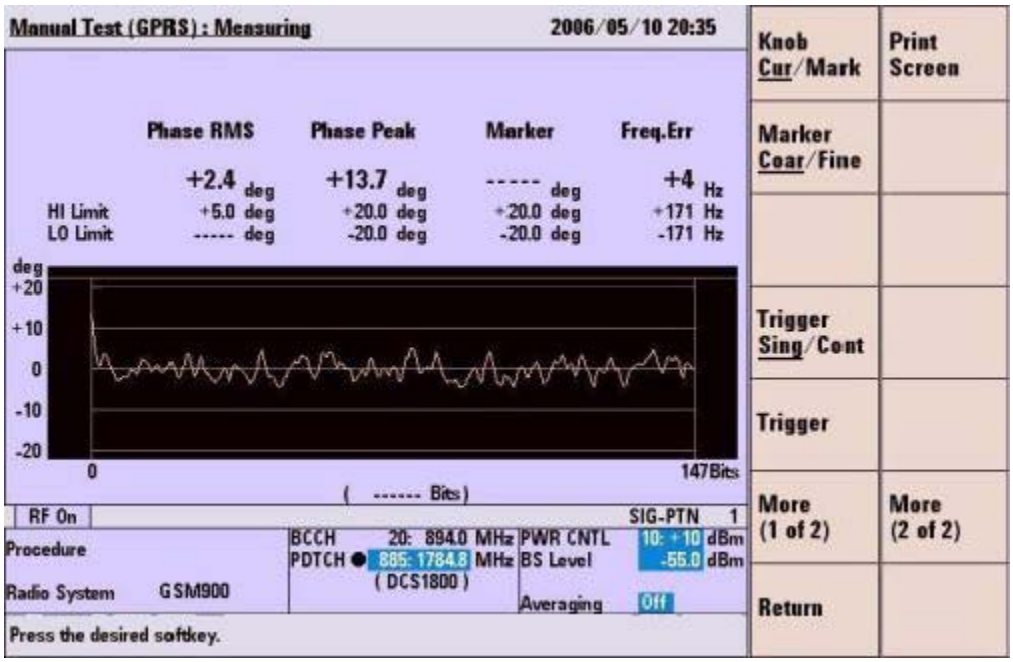
Measurement Item	Description
Peak TX Power	Measured Peak TX Power, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
Burst Timing	Measured Burst Timing, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
Power Ramp	Measured Power Ramp, the HI and the LO Limit are shown. The limits are specified by the radio system selected (template).

The RMS and Peak Phase Error and Frequency Error are shown along with the marker readout if the marker is activated.

If the measured data exceeds the limits on the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-49 [Measuring] Phase Error/ Frequency Error Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the phase error magnitude and timeslot (in bits) is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.

- To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
- This softkey is effective only for changing the trigger mode on the [Stand-by] screen.

- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-36 [Manual Test] GPRS Mode Phase Error/Frequency Error Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on a [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` This field cannot be changed on the [Measuring] screen.

Table 5-36 [Manual Test] GPRS Mode Phase Error/Frequency Error Screen Input Field

Input Field	Description
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from -110.0 to -50.0 dBm in 0.1 dB step. The default value is set on the [Configuration: Test Condition] screen.
Averaging *	Sets the averaging number from 2 to 99 or Off. When this function is not required, select Off.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement items are shown in the screen field.

Table 5-37 [Manual Test] GPRS Mode Phase Error/Frequency Error Screen Field

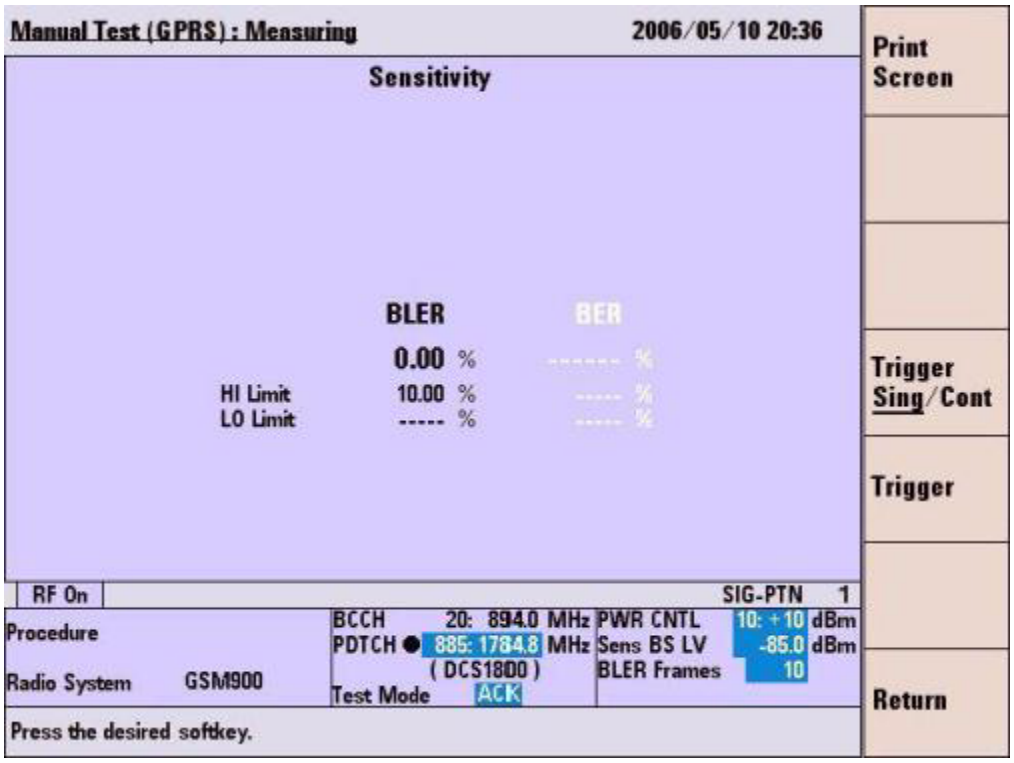
Screen Field	Description
RMS	Measured Phase Error (RMS) and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
Phase Peak	Measured Phase Error (Peak), the HI and the LO Limit are shown. A set of the HI and the LO Limit is set on the [Configuration: Test Condition] screen.
Marker	Measured Phase Error at the marker position, the HI and the LO Limit are shown. Measured data is shown when the marker is placed on the measurement trace. The HI Limit is set on the [Configuration: Test Condition] screen.
Freq. Err	Measured Frequency Error, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Sensitivity in BLER

The measured data for BLER (block error rate) is shown as Figure 5-50.

Any data indicating a failure is highlighted.

Figure 5-50 [Measuring] Sensitivity in BLER Screen



Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
  - To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.

• This softkey is effective only for changing the trigger mode on the [Stand-by] screen.

- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **Return**: Returns to the previous screen.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-38 [Manual Test] GPRS Mode Sensitivity Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on a [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810 This field cannot be changed on the [Measuring] screen.
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
Test Mode	Selects from ACK, A, or B. ACK: Measurement of Peak TX Power, Phase Error, Frequency Error, and BLER A: Measurement of Peak TX Power, Phase Error, and Frequency Error B: Measurement of Peak TX Power, Phase Error, and Frequency Error. Active in Unacknowledged Mode for UL/DL.

Table 5-38 [Manual Test] GPRS Mode Sensitivity Screen Input Field

Input Field	Description
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
Sens BS Lv *	Sets the RF output level of the Tester for the Sensitivity test. The allowable range is from -110.0 to -50.0 dBm in 0.1 dB steps.
BLER Frames * (Test Mode: ACK) BER Frames * (Test Mode: B)	Sets the number of test frames for BLER and BER measurement. The allowable range is from 1 to 13000. BER Frames: displays the number of test bits. Coding Scheme: The number of test bits for CS1, derived from an equation **BER Frames multiplied by 160 bits**, is displayed. Coding Scheme: The number of test bits for CS2, derived from an equation **BER Frames multiplied by 240 bits**, is displayed. Coding Scheme: The number of test bits for CS3, derived from an equation **BER Frames multiplied by 288 bits**, is displayed. Coding Scheme: The number of test bits for CS4, derived from an equation **BER Frames multiplied by 400 bits**, is displayed.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement result is displayed in the screen field.

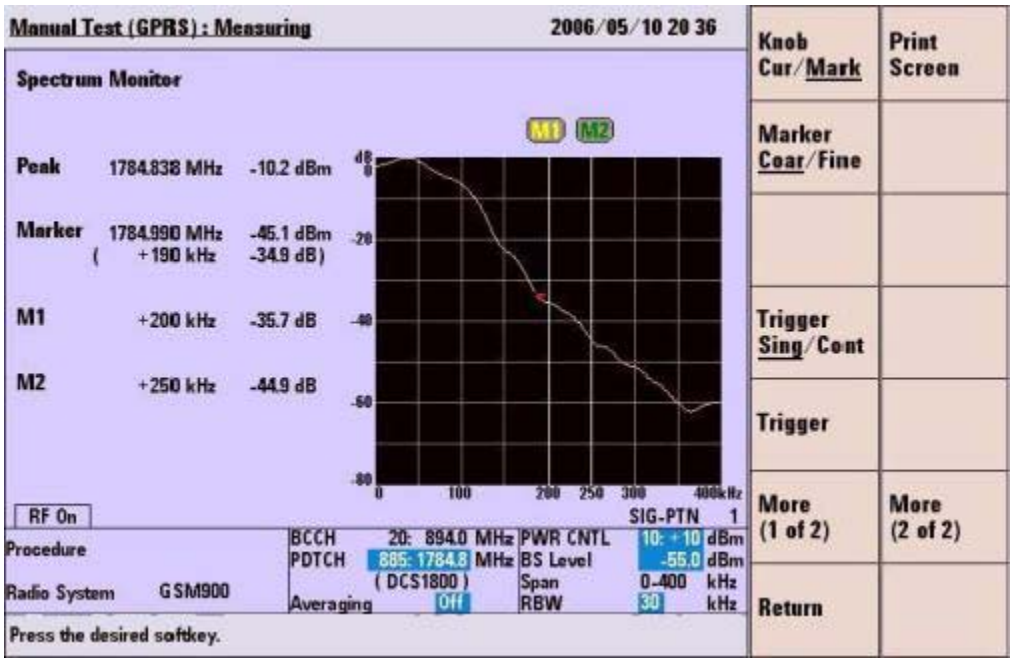
Table 5-39 [Manual Test] GPRS Mode Sensitivity Screen Field

Screen Field	Description
BLER (Test Mode: ACK)	Measured BLER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
BER (Test Mode: B)	Measured BER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.

Spectrum Monitor

The RF spectrum of the packet data traffic channel can be measured by Spectrum Monitor. The spectrum, which is measured from f_c to f_c + 400 kHz relative to the packet data traffic channel frequency, is shown with readouts at +200 kHz (M1) and +250 kHz (M2) offsets.

Figure 5-51 [Measuring] Spectrum Monitor Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the frequency and amplitude is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.

- To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
- This softkey is effective only for changing the trigger mode on the [Stand-by] screen.

- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand]-by screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Fields

Set the input fields of the following parameters to execute a new spectrum test.

Table 5-40 [Manual Test] GPRS Mode Spectrum Monitor Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on the [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` This field cannot be changed on the [Measuring] screen.

Table 5-40 [Manual Test] GPRS Mode Spectrum Monitor Screen Input Field

Input Field	Description
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
Averaging *	Displays the average value of Peak TX Power, Phase Error, and Frequency Error. Sets the averaging number from 2 to 200, or Off. When this function is not required, select Off.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester. The allowable range is from -110.0 to -50.0 dBm in 0.1 dB step. The default value is set on the [Configuration: Test Condition] screen.
RBW	Selects 10 kHz or 30 kHz resolution bandwidth as follows: • 10: Sets the resolution bandwidth to 10 kHz. • 30: Sets the resolution bandwidth to 30 kHz.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement results are shown in the screen field:

Table 5-41 [Manual Test] GPRS Mode Spectrum Monitor Screen Field

Screen Field	Description
Peak	The absolute peak power and frequency are shown.
Marker *	The readout of frequency and amplitude at the marker position is shown as follows when the marker is activated by the **Knob Cur/Marker** softkey setting: • ——— MHz —— dBm: The absolute frequency and amplitude at the marker position are shown. • (—— kHz —— dB): The relative frequency and amplitude the marker position are shown.
M1: +200kHz M2: +250kHz	The amplitude at +200 kHz and +250 kHz offsets relative to the packet data traffic channel frequency are also shown.

* The resolution of the marker on the screen is not equivalent to the measurement resolution.

Manual Test (EGPRS Mode)

NOTE Install the Option G03 before using EGPRS function.

Description of EGPRS System

The Enhanced General Packet Radio Service (EGPRS), or enhanced GPRS, employs a new modulation scheme called EDGE (Enhanced Data GSM Environment). The scheme employs eight phase-shift keying (8-PSK), and achieves high-speed data transmission of maximum 236.8kbps.

Feature of Manual Test GPRS Mode

All test items are executed while the mobile phone and the Tester are connected by call control protocol.

Setting for Manual Test EGPRS Mode in the Configuration Mode

- Loss:

  The path loss value for each radio system can be set on the [Configuration] screen to correct the RF attenuation between the mobile phone and the Tester.

- Limits of measurement items:

  Each measurement item can be measured and analyzed with the measurement limits set on the [Configuration: Test Condition] screen.

Slot Configuration and Measurement Slot

The combination of the slot configuration and the order of measurement slot are follows:

Table 5-42 Slot Configuration and Measurement Slot

Slot Configuration	Measurement Slot
1×1	2
2×1, 3×1	3
4×1	4

Table 5-42 Slot Configuration and Measurement Slot

Slot Configuration	Measurement Slot
2×2	2 or 3
3×2	3 or 4

NOTE

For numeric value entry, the changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13. The default state is the last setting stored in the internal memory of the Tester before power off.

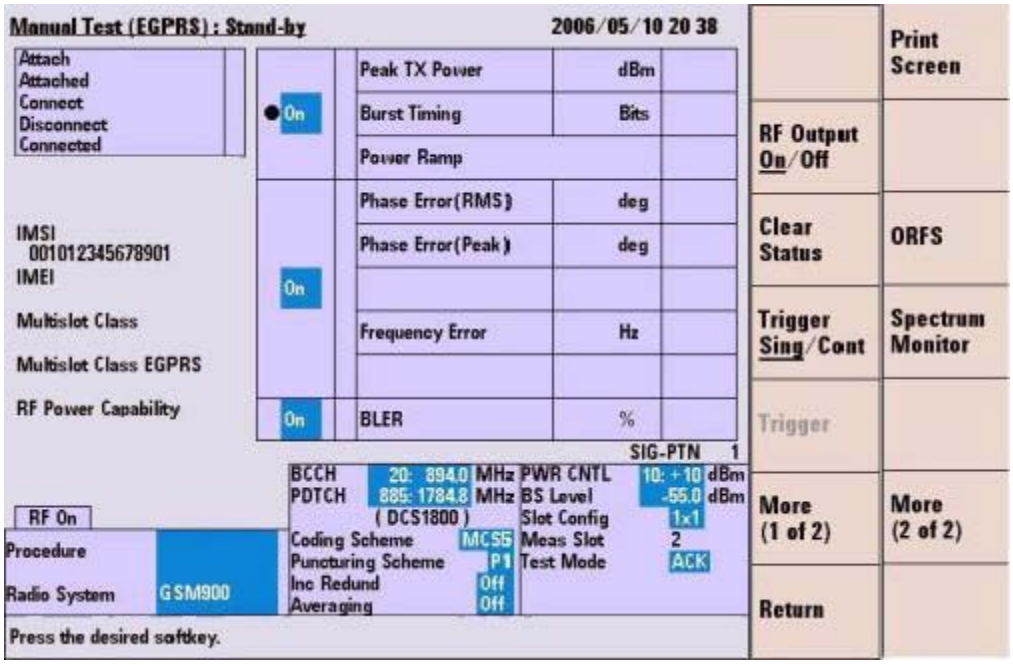
Test SIM

Insert the Test SIM provided by Agilent in the mobile phone before performing any test because the Tester will not be able to perform measurements with a SIM that is provided by cell phone operator or other Test SIMs.

Stand-by Screen

When the EGPRS is selected in the **GSM mode** from the [Configuration: Test Condition] screen, the following [Manual Test: Stand-by] screen is displayed.

Figure 5-52 [Manual Test: Stand-by] EGPRS Mode Screen



Softkey Menu Field

Softkey Menu 1

- **Clear Status**: Clears Pass/Fail results at signaling steps in the test flow.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode provides single measurement in RF test.
  - The `Cont` mode provides continuous measurement in RF test.
- **Trigger**: Starts single measurement in the attached status. This softkey is invalid in the Stand-by status but activated in the attached status.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **ORFS**: Displays the [Output RF spectrum] screen when Coding Scheme is set to MCS5 to MCS9.
- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Fields

Set the input fields on the screen field according to the following description of Table 5-43 to execute a new test.

Table 5-43 [Manual Test: Stand-by] EGPRS Mode Screen Input Field

Input Field	Description
Measuring mode	Sets whether or not to execute test items or each group of test items. Select `On` or `Off`. • Peak TX Power, Burst Timing, Power Ramp • Phase Error (RMS), Phase Error (Peak), Frequency Error • Sensitivity/BLER
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 or PCS1900.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Coding Scheme	Sets the Coding Scheme of PDTCH data (up and down). Selects from CS1 to CS4. Attach: Up/Down CS1: fixed

Table 5-43 [Manual Test: Stand-by] EGPRS Mode Screen Input Field

Input Field	Description
Inc Redund	Sets `On` or `Off` of the Incremental Redundancy of re-forwarding PDTCH during Test Mode: Ack test.
Averaging	Displays the average value of Peak TX Power, Phase Error, and Frequency Error. Sets the averaging number from `2` to `200`, or `Off`. When this function is not required, select `Off`.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from `-110.0` to `-50.0` dBm in `0.1` dB step. The default value is set on the [Configuration: Test Condition] screen.
Slot Config	Selects 1×1, 2× 1, 2×2, 3×1, 3×2, or 4×1
Measur Slot	When the **Slot Config** is set to 2×2 or 3×2, this field becomes a settable field. Selects measurement slot from 2 to 4 depending on the setting of the **Slot Config**.
Test Mode	Selects from ACK, A, or B. ACK: Measurement of Peak TX Power, Phase Error, Frequency Error, and BLER A: Measurement of Peak TX Power, Phase Error, and Frequency Error B: Measurement of Peak TX Power, Phase Error, Frequency Error and BER. Active in Unacknowledged Mode for UL/DL.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The following measurement items are displayed in groups in the table. When a group of measurement items is selected with the CURSOR CONTROL knob, the Graph/Value screen for each group is displayed.

Table 5-44 Manual Test EGPRS Mode Measurement Item

Measurement Item	Description
Peak TX Power Burst Timing Power Ramp	Measurement results of Peak TX Power, Burst Timing and Power Ramp are shown. When this field is selected, the Graph/Value screen for **Peak TX Power/ Burst Timing/ Power Ramp** is displayed with measurement results on text and graph display. If the marker function is active, the Power Ramp value is displayed according to the marker position.
Phase Error (RMS) Phase Error (Peak) Frequency Error	Measurement results of Phase Error and Frequency Error are shown. When this field is selected, the Graph/Value screen for **Phase Error/ Frequency Error** is displayed with measurement results on text and graph display.

Table 5-44 Manual Test EGPRS Mode Measurement Item

Measurement Item	Description
EVM (RMS) EVM (Peak) EVM (95%) Frequency Error Origin Offset Spr.	Measurement result of EVM, Phase Error, and Origin Offset Spr are shown. When this field is selected, the Graph/Value screen for **EVM/ Frequency Error/OOS** is displayed with measurement results on text and graph display. Test Mode: displayed when Coding Scheme: MCS5 to MCS9 is selected at A, B, SRB.
BLER (Test Mode: ACK)	Measurement result of BLER is shown. When this field is selected, the Graph/Value screen for **Sensitivity** is displayed with measurement result on text display.

The information from the mobile phone is displayed on the left side of the screen:

Table 5-45 Manual Test EGPRS Mode Measurement Item

Item Information	Description
IMSI	Displays the default value of International Mobile Subscriber Identity. The default value is 001012345678901.
IMEI	This field remains blank at this state.
Multislot Class	This field remains blank at this state.
Multislot Class EGPRS	This field remains blank at this state.
RF Power Capability	This field remains blank at this state.

The **RF On** indicator is displayed at the lower left side corner of the screen only when the RF signal from the Tester is present at the RF IN/OUT connector.

Message Field

The following message is displayed on the [Stand-by] screen:

Press the desired softkey.

Explanation

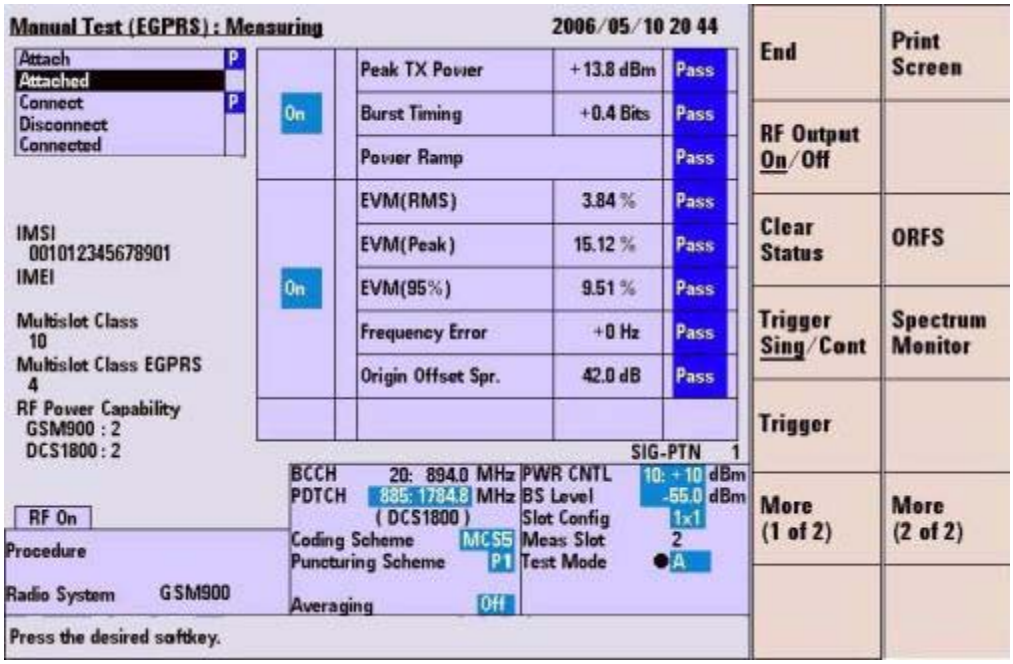
To start a test, turn the mobile phone on and wait for the **Attach** step is passed. After that, the [Manual Test: Measuring] Attached screen is displayed.

Attached Screen

After completion of the attaching process, the [Measuring] screen as Figure 5-44 is displayed.

The **Attached** step in the test flow field is highlighted and **P** is shown at the test result cell for the **Attach** step.

Figure 5-53 [Measuring] Attached Screen



Softkey Menu Field

Softkey Menu 1

- **End**: Starts the detach process.
- **Clear Status**: Clears Pass/Fail results at signaling steps in the test flow.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode provides single measurement.
  - The `Cont` mode provides continuous measurement.
  - To start continuous measurement, change the trigger mode from `Sing` to `Cont`.
- **Trigger**: Starts single measurement.

- **More (1 of 2)**: Displays the softkey menu 2.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **ORFS**: Displays the [Output RF spectrum] screen when Coding Scheme is set to MCS5 to MCS9.
- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

The following input field can be changed on the [Measuring] screen. Change the input fields according to Table 5-32.

Table 5-46 [Manual Test: Measuring] EGPRS Mode Screen Input Field

Input Field	Description
Measuring mode	Sets whether or not to execute test items or each group of test items. Select `On` or `Off`. • Peak TX Power, Burst Timing, Power Ramp • Phase Error (RMS), Phase Error (Peak), Frequency Error • Sensitivity/BLER
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Coding Scheme	Sets the Coding Scheme of PDTCH data (up and down). Selects from CS1 to CS4. Attach: Up/Down CS1: fixed
Puncturing Scheme	Sets the Puncturing Scheme of PDTCH data (down). Selects from P1 to P3. P3 is selected only for MCS3, MCS4, MCS7, MCS8 and MCS9.
Inc Redund	Sets `On` or `Off` of the Incremental Redundancy of re-forwarding PDTCH during Test Mode: Ack test.
Averaging	Displays the average value of Peak TX Power, Phase Error, and Frequency Error. Sets the averaging number from `2` to `200`, or `Off`. When this function is not required, select `Off`.

Table 5-46 [Manual Test: Measuring] EGPRS Mode Screen Input Field

Input Field	Description
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from -110.0 to -50.0 dBm in 0.1 dB step. The default value is set on the [Configuration: Test Condition] screen.
Slot Config	Selects 1×1, 2× 1, 2×2, 3×1, 3×2, or 4×1
Measur Slot	When the **Slot Config** is set to 2×2 or 3×2, this field becomes a settable field. Selects measurement slot from 2 to 4 depending on the setting of the **Slot Config**.
Test Mode	Selects from ACK, A, or B. ACK: Measurement of Peak TX Power, Phase Error, Frequency Error, and BLER A: Measurement of Peak TX Power, Phase Error, and Frequency Error B: Measurement of Peak TX Power, Phase Error, Frequency Error and BER. Active in Unacknowledged Mode for UL/DL.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The information from the mobile phone is displayed on the left side of the screen.

Table 5-47 [Manual Test] EGPRS Mode Attached Screen Mobile Phone Information

Item Information	Description
IMSI	Displays the International Mobile Subscriber Identity from the mobile phone.
IMEI	Displays the International Mobile station Equipment Identity from the mobile phone.
Multislot Class	Displays the Multislot Class of the Mobile phone, ranging from 1 to 12.
Multislot Class EGPRS	Displays the EGPRS Multislot Class of the Mobile phone, ranging from 1 to 12.
RF Power Capability	Displays the power class for each Radio System, ranging from 1 to 5.

Message Field

The following message is displayed in the message field on the [Measuring] screen:

Press the desired softkey.

Explanation

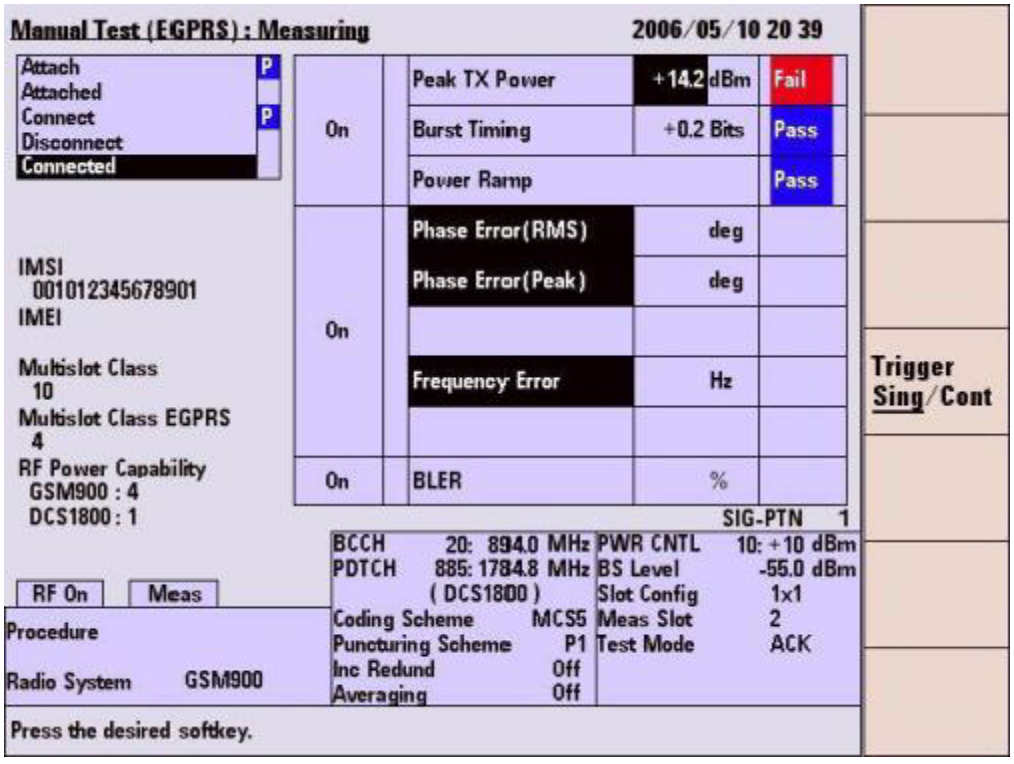
The **Connect** process starts and measurement is executed with the following ways:

- Press the **Trigger** softkey to execute single measurement.
- Press the **Trigger Sing/Cont** softkey to change the trigger mode from `Sing` to `Cont` in order to execute continuous measurement.

Connected Screen

When measurement starts, the [Measuring] connected screen as Figure 5-45 is displayed.

Figure 5-54 [Measuring] Connected Screen



Softkey Menu Field

Softkey Menu

- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).

- The `Sing` mode setting provides single measurement. When the trigger mode is changed from `Sing` to `Cont`, the continuous measurement starts.
- The `Cont` mode setting provides continuous measurement. When the trigger mode is changed from `Cont` to `Sing`, the measurement is terminated.

Summary Screen

After completion of the measurement in the **Connected** step, the disconnect process starts, and then a [Measuring] summary screen showing measurement results is automatically displayed.

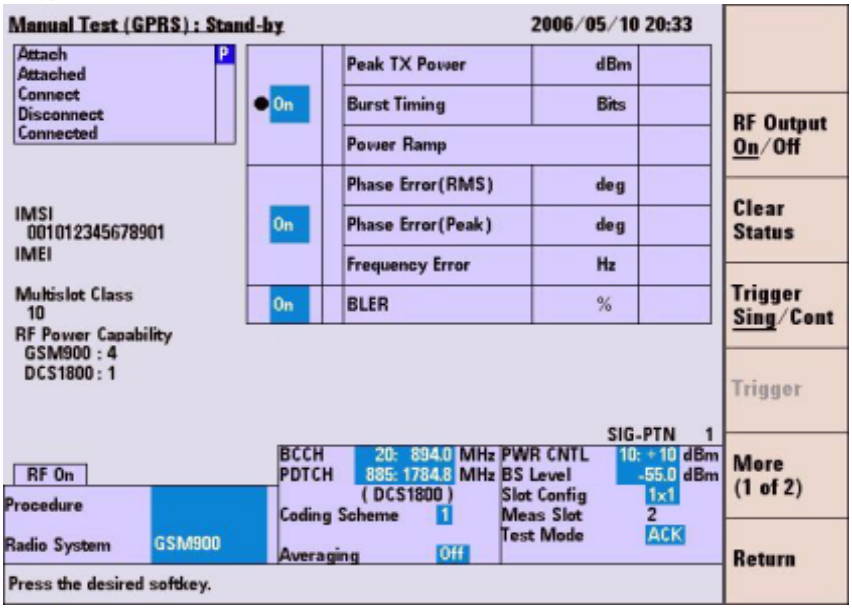
To end the measurement in the attached status, press the **End** softkey to start the detach process.

When the detach process is completed, a [Stand-by] summary screen as Figure 5-46 is displayed.

A measurement result and Pass/Fail result are shown right next to each measurement item.

- `Pass`: Shown on blue background when the measurement is passed.
- `Fail`: Shown on red background when the measurement is failed.

Figure 5-55 [Stand-by] Summary Screen



Softkey Menu Field

Softkey Menu 1

- **Clear Status**: Clears Pass/Fail results at signaling steps in the test flow.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode provides single measurement in RF test.
  - The `Cont` mode provides continuous measurement in RF test.
- **Trigger**: Starts measurement in the attached status. This softkey is invalid in the Stand-by status but activated in the attached status.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **ORFS**: Displays the [Output RF spectrum] screen when Coding Scheme is set to MCS5 to MCS9.
- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

The information in the screen field is displayed. Refer to Table 5-29 [Manual Test: Stand-by] GPRS Mode Screen Input Field on page 81 and Table 5-33 [Manual Test] GPRS Mode Attached Screen Mobile Phone Informationon page 86. The input field in the screen field can be changed for a new test.

Procedure to obtain a Graph/Value screen

To obtain a Graph/Value from the [Stand-by] summary screen or the [Measuring] summary screen, follow the procedure described below.

Step 1

Place the cursor at one of the test items by rotating the CURSOR CONTROL knob.

Step 2

Select the test item by pressing the CURSOR CONTROL knob.

Step 3

Either a measurement result list or a graph with a measurement result list is displayed according to each measurement item.

Measuring cannot be executed on the Graph/Value screen obtained from the [Stand-by] screen because the call connection between the mobile phone and the Tester is disconnected.

Graph/Value Screen

Peak TX Power/ Burst Timing/ Power Ramp

The measured data are shown in enlarged numerals.

The Power Ramp result is shown when the marker is placed at any point on its measured trace.

If the measured data exceeds the limits on the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-56[Measuring] Peak TX Power/ Burst Timing/ Power Ramp Screen

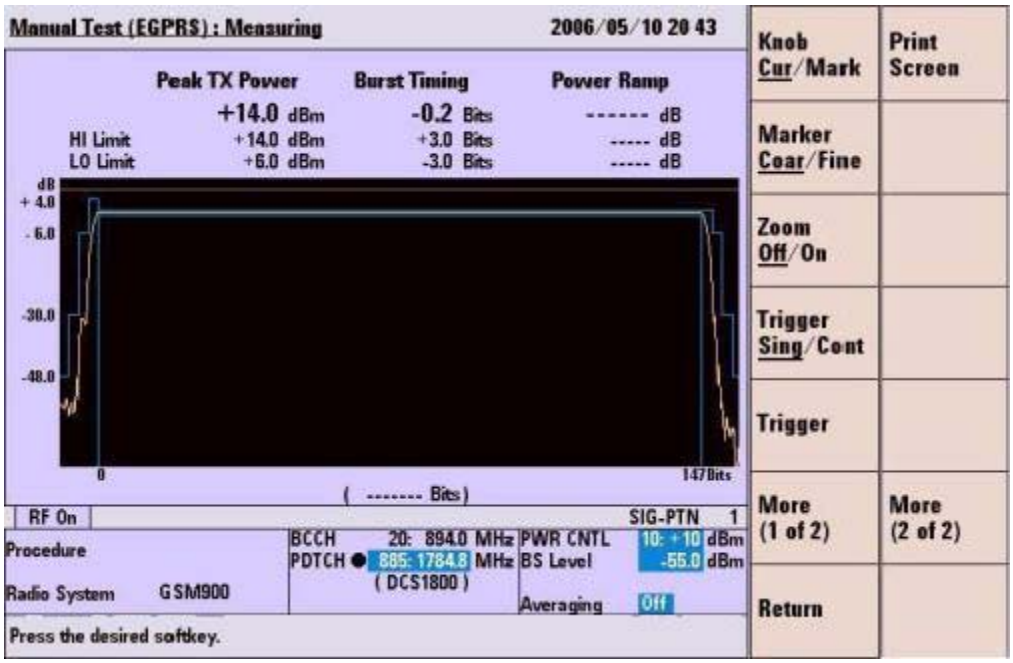
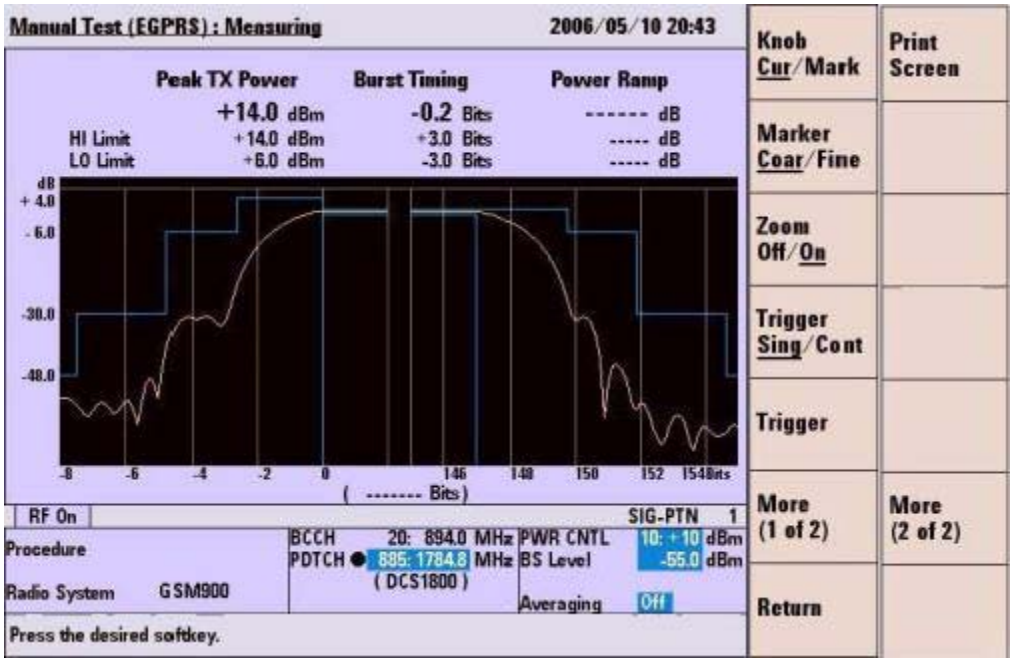


Figure 5-57[Measuring] Peak TX Power/ Burst Timing/ Power Ramp Zoomed Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the amplitude and timeslot (in bits) is available at any point of the measured trace.
- **Zoom Off/On**: Toggles the zooming function between `Off` and `On`. If `On` is selected, the rising edge, between `-8` bits and `0` bits, and trailing edge, between `147` and `155` bits, of the Power Ramp waveforms are expanded to observe the derailed test result as shown in Figure .
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).

- The `Sing` mode setting provides single measurement.
- The `Cont` mode setting provides continuous measurement.
- To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
- To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
- This softkey is effective only for changing the trigger mode on the [Stand-by] screen.

- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-48 [Manual Test] EGPRS Mode Peak TX Power/ Burst Timing/Power Ramp Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on a [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.

Table 5-48 [Manual Test] EGPRS Mode Peak TX Power/ Burst Timing/Power Ramp Screen Input Field

Input Field	Description
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` This field cannot be changed on the [Measuring] screen.
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from `-110.0` to `-50.0` dBm in `0.1` dB step. The default value is set on the [Configuration: Test Condition] screen.
Averaging *	Sets the averaging number from `2` to `99` or `Off`. When this function is not required, select `Off`.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

NOTE A Pass/Fail judgment is not given while transmission power is off.

The measurement results are shown in the screen field.

Table 5-49 [Manual Test] EGPRS Mode Peak TX Power/Burst Timing/Power Ramp Screen Field

Measurement Item	Description
Peak TX Power	Measured Peak TX Power, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Table 5-49 [Manual Test] EGPRS Mode Peak TX Power/Burst Timing/Power Ramp Screen Field

Measurement Item	Description
Burst Timing	Measured Burst Timing, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
Power Ramp	Measured Power Ramp, the HI and the LO Limit are shown. The limits are specified by the radio system selected (template).

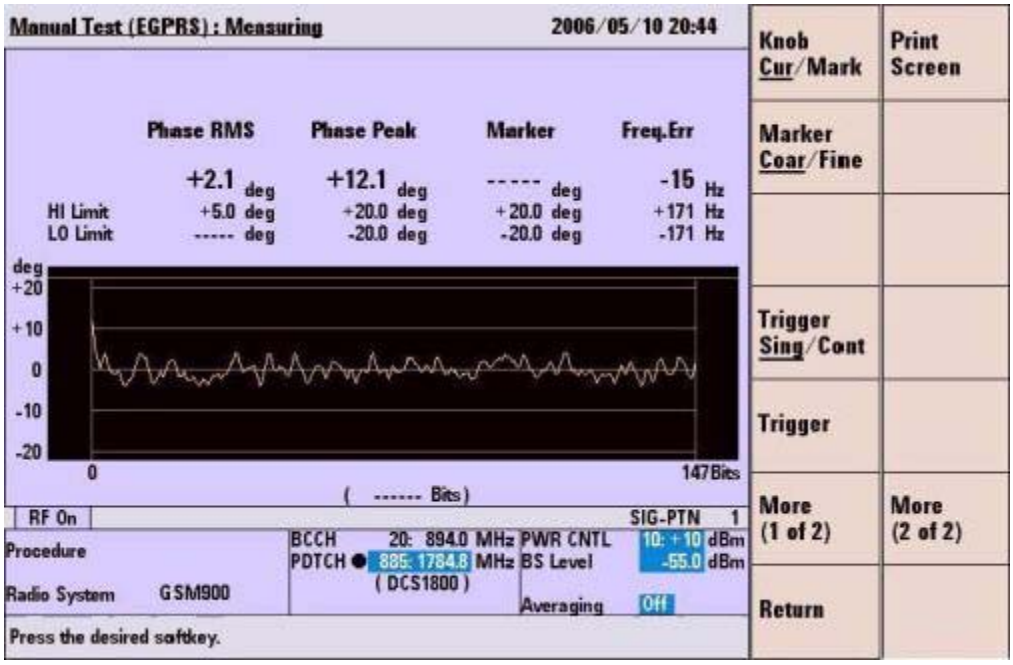
Phase Error/ Frequency Error

The RMS and Peak Phase Error and Frequency Error are shown along with the marker readout if the marker is activated.

If the measured data exceeds the limits on the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-58[Measuring] Phase Error/ Frequency Error Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the phase error magnitude and timeslot (in bits) is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
  - To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
  - This softkey is effective only for changing the trigger mode on the [Stand-by] screen.
- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-50 [Manual Test] EGPRS Mode Phase Error/Frequency Error Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on a [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810 This field cannot be changed on the [Measuring] screen.
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from -110.0 to -50.0 dBm in 0.1 dB step. The default value is set on the [Configuration: Test Condition] screen.
Averaging *	Sets the averaging number from 2 to 99 or Off. When this function is not required, select Off.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement items are shown in the screen field.

Table 5-51 [Manual Test] EGPRS Mode Phase Error/Frequency Error Screen Field

Screen Field	Description
Phase RMS	Measured Phase Error (RMS) and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
Phase Peak	Measured Phase Error (Peak), the HI and the LO Limit are shown. A set of the HI and the LO Limit is set on the [Configuration: Test Condition] screen.
Marker	Measured Phase Error at the marker position, the HI and the LO Limit are shown. Measured data is shown when the marker is placed on the measurement trace. The HI Limit is set on the [Configuration: Test Condition] screen.
Freq. Err	Measured Frequency Error, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

NOTE Phase Error/Frequency Error function is valid when the Coding Scheme is set to MCS1 to MCS4 on the [Standby] Screen.

EVM

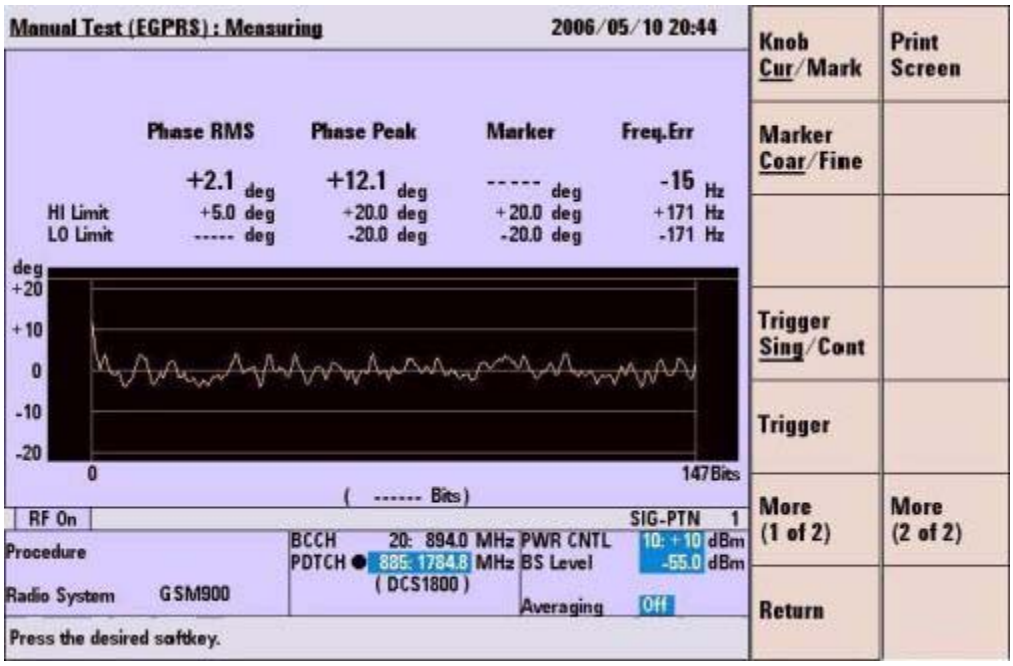
NOTE Install the Option G03 to display EVM screen (EGPRS mode). Set the Coding Scheme to MCS5 to MCS9 on the [Standby] Screen.

The RMS, Peak, 95 %, Frequency Error, and Origin Offset are shown along with the marker readout if the marker is activated.

If the measured data exceeds the limits on the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-59 [Measuring] EVM Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the phase error magnitude and timeslot (in bits) is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.

- To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
- This softkey is effective only for changing the trigger mode on the [Stand-by] screen.

- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-52 [Manual Test] EGPRS Mode EVM Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on a [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` This field cannot be changed on the [Measuring] screen.

Table 5-52 [Manual Test] EGPRS Mode EVM Screen Input Field

Input Field	Description
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
EVM Meas. Count	Sets Measurement Burst during EVM test, ranging from 1 to 200.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester, ranging from -110.0 to -50.0 dBm in 0.1 dB step. The default value is set on the [Configuration: Test Condition] screen.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement items are shown in the screen field.

Table 5-53 [Manual Test] EGPRS Mode EVM Screen Field

Screen Field	Description
EVM RMS	Measured EVM (RMS) and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
EVM Peak	Measured EVM (Peak), the HI and the LO Limit are shown. A set of the HI and the LO Limit is set on the [Configuration: Test Condition] screen.
EVM 95%	Measured EVM (95%) and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
Marker	Measured Phase Error at the marker position, the HI and the LO Limit are shown. Measured data is shown when the marker is placed on the measurement trace. The HI Limit is set on the [Configuration: Test Condition] screen.
Freq. Err	Measured Frequency Error, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
OOS	Measured Origin Offset, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Message Field

The following message is displayed in the message field on the [Measuring] screen:

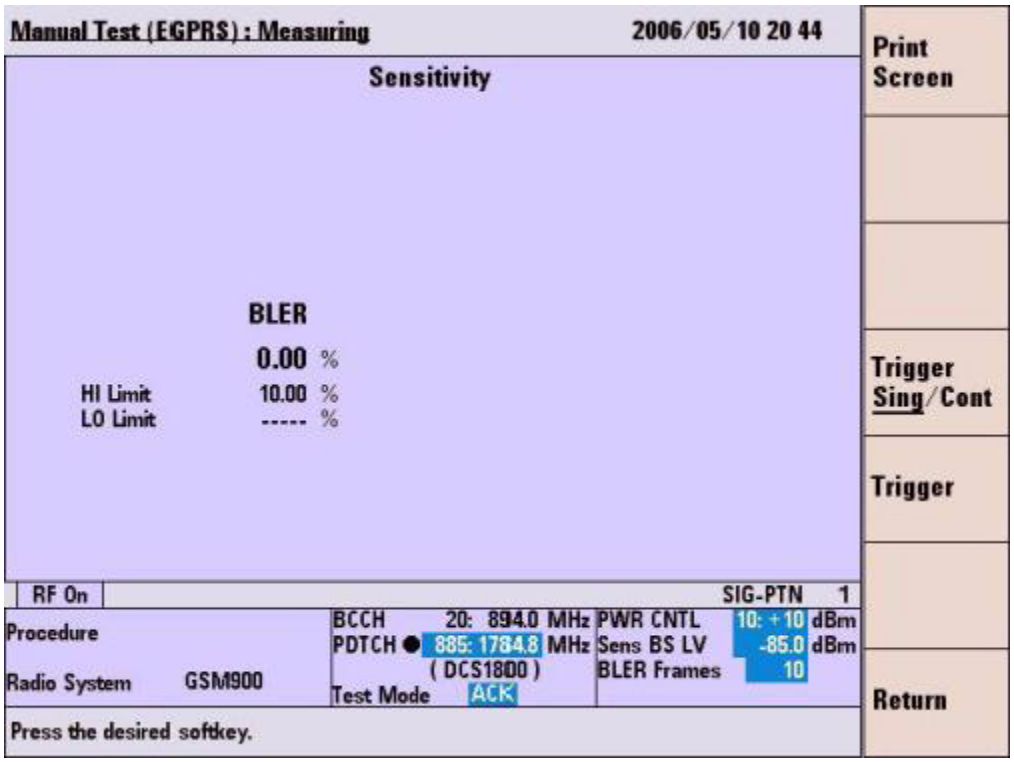
Press the desired softkey.

Sensitivity in BLER

The measured data for BLER (block error rate) is shown as Figure 5-60.

Any data indicating a failure is highlighted.

Figure 5-60 [Measuring] Sensitivity in BLER Screen



Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.

- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
  - To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
  - This softkey is effective only for changing the trigger mode on the [Stand-by] screen.
- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **Return**: Returns to the previous screen.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-54 [Manual Test] EGPRS Mode Sensitivity Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on a [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` This field cannot be changed on the [Measuring] screen.

Table 5-54 [Manual Test] EGPRS Mode Sensitivity Screen Input Field

Input Field	Description
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
Test Mode	Selects from ACK, A, or B. (Only ACK mode is available for measuring.)
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
Sens BS Lv *	Sets the RF output level of the Tester for the Sensitivity test. The allowable range is from -110.0 to -50.0 dBm in 0.1 dB steps.
BLER Frames * (Test Mode: ACK)	Sets the number of test frames for BLER measurement. The allowable range is from 1 to 13000.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement result is displayed in the screen field.

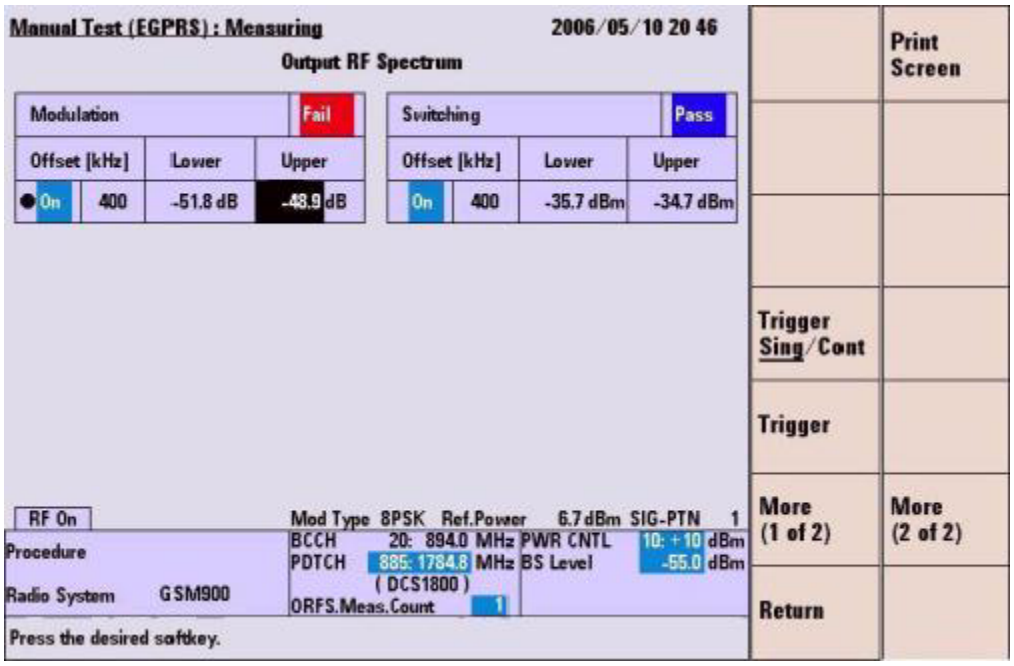
Table 5-55 [Manual Test] EGPRS Mode Sensitivity Screen Field

Screen Field	Description
BLER (Test Mode: ACK)	Measured BLER and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.

Output RF Spectrum (ORFS)

The power of the adjacent channels can be measured. The screen of the Output RF Spectrum (ORFS) shows the measurement result of the Modulation and Switching at the carrier frequency rate of –400 kHz and +400 kHz.

Figure 5-61 [Output RF Spectrum] Screen



Softkey Menu Field

Softkey Menu 1

- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
  - To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
  - This softkey is effective only for changing the trigger mode on the [Stand-by] screen.
- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-56 [Manual Test] EGPRS Mode ORFS Screen Input Field

Input Field	Description
Measuring mode	Sets whether or not to execute each group of test items. Select `On` or `Off`. • Modulation • Switching
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on a [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` This field cannot be changed on the [Measuring] screen.
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
ORFS.Meas. Count	Sets Measurement Burst during ORFS test, ranging from `1` to 200.

Table 5-56 [Manual Test] EGPRS Mode ORFS Screen Input Field

Input Field	Description
PWR CNTL *	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester. The allowable range is from -110.0 to -50.0 dBm in 0.1 dB steps.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement result is displayed in the screen field.

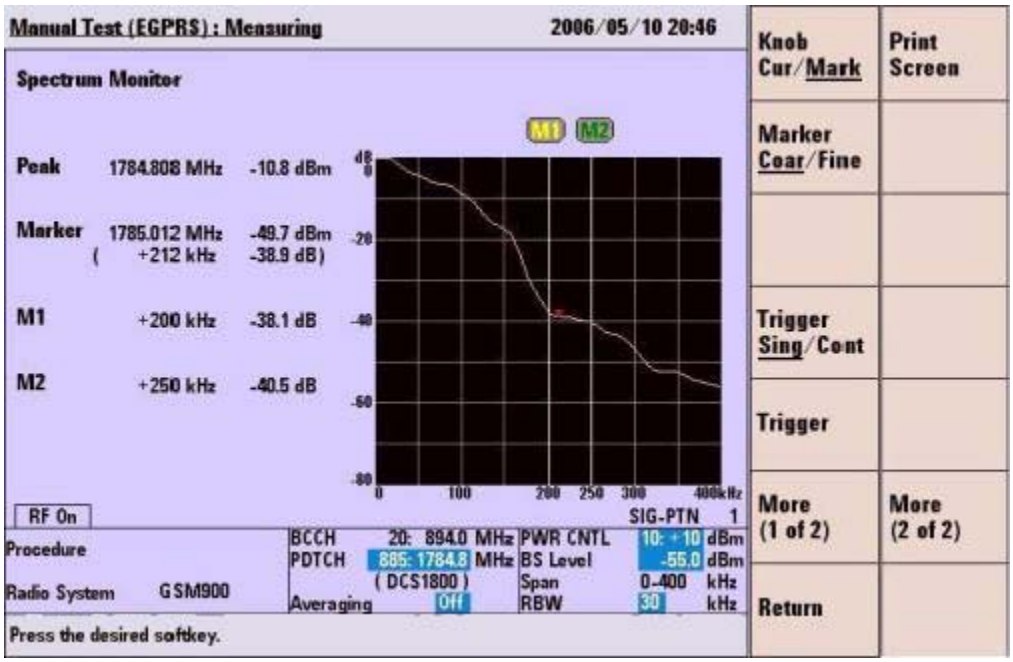
Table 5-57 [Manual Test] EGPRS Mode ORFS Screen Field

Screen Field	Description
Modulation	Displays measured Modulation value of carrier frequency at +400 kHz (Upper) and –400 kHz (Lower).
Switching	Displays measured Switching transient value of carrier frequency at +400 kHz (Upper) and –400 kHz (Lower).
Modulation Type	The Modulation Type is shown.
Ref. Power	The power at the time of measurement is shown.

Spectrum Monitor

The RF spectrum of the packet data traffic channel can be measured by Spectrum Monitor. The spectrum, which is measured from f_c to f_c + 400 kHz relative to the packet data traffic channel frequency, is shown with readouts at +200 kHz (M1) and +250 kHz (M2) offsets.

Figure 5-62 [Measuring] Spectrum Monitor Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the frequency and amplitude is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.

- To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
- This softkey is effective only for changing the trigger mode on the [Stand-by] screen.

- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand]-by screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Fields

Set the input fields of the following parameters to execute a new spectrum test.

Table 5-58 [Manual Test] EGPRS Mode Spectrum Monitor Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection. This field cannot be changed on the [Measuring] screen.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` This field cannot be changed on the [Measuring] screen.

Table 5-58 [Manual Test] EGPRS Mode Spectrum Monitor Screen Input Field

Input Field	Description
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
Averaging *	Displays the average value of Peak TX Power, Phase Error, and Frequency Error. Sets the averaging number from 2 to 200, or Off. When this function is not required, select Off.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester. The allowable range is from -110.0 to -50.0 dBm in 0.1 dB step. The default value is set on the [Configuration: Test Condition] screen.
RBW	Selects 10 kHz or 30 kHz resolution bandwidth as follows: • 10: Sets the resolution bandwidth to 10 kHz. • 30: Sets the resolution bandwidth to 30 kHz.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement results are shown in the screen field:

Table 5-59 [Manual Test] EGPRS Mode Spectrum Monitor Screen Field

Screen Field	Description
Peak	The absolute peak power and frequency are shown.
Marker *	The readout of frequency and amplitude at the marker position is shown as follows when the marker is activated by the **Knob Cur/Marker** softkey setting: • ——— MHz —— dBm: The absolute frequency and amplitude at the marker position are shown. • (—— kHz —— dB): The relative frequency and amplitude the marker position are shown.
M1: +200kHz M2: +250kHz	The amplitude at +200 kHz and +250 kHz offsets relative to the packet data traffic channel frequency are also shown.

* The resolution of the marker on the screen is not equivalent to the measurement resolution.

TX Analyzer

Feature of TX Analyzer

- All test items are measured without signaling process.
- This mode is used to test the RF transmission characteristics of mobile phones in a real-time.

Setting for TX Analyzer in the Configuration Mode

- Limits of measurement item:

  Each measurement item can be measured and analyzed with the measurement limits set on the [Configuration: Test Condition] screen.

- Loss:

  The path loss value for each radio system can be set on the [Configuration] screen to correct the RF attenuation between the mobile phone and the Tester.

Setting for TX Analyzer in the Signal Generator Mode

- The setting of `RF ON/OFF` and `Amplitude` works with those on the [Signal Generator] screen.

NOTE

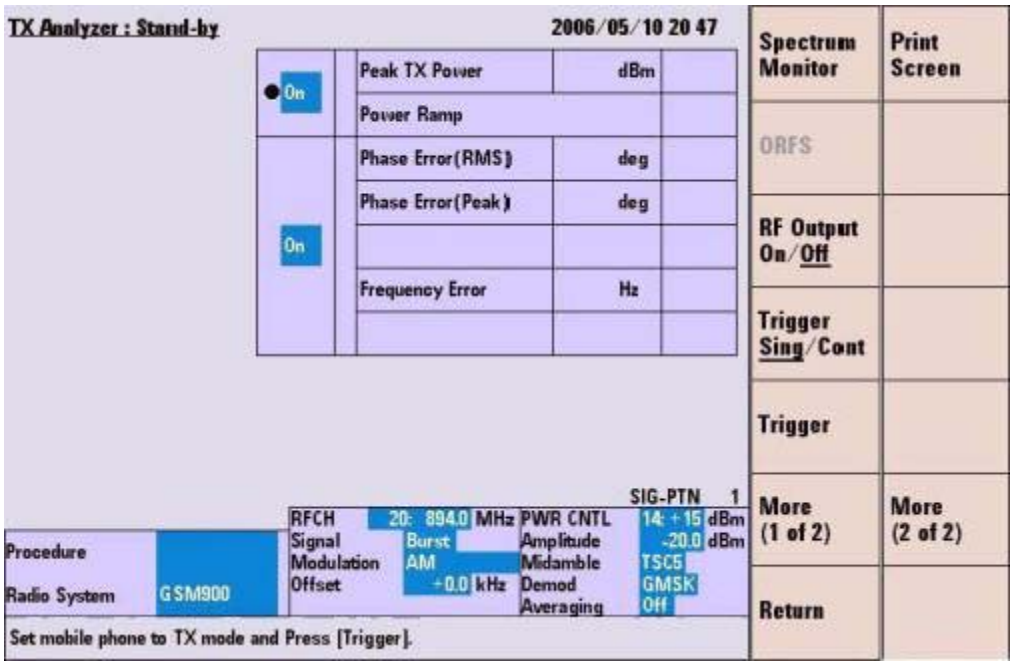
For numeric value entry, the changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The default state is the last setting stored in the internal memory before power off.

Stand-by Screen

When the **TX Analyzer** softkey is pressed on the [Initial] screen, the [TX Analyzer: Stand-by] screen as Figure 5-63 is displayed:

Figure 5-63 [TX Analyzer: Stand-by] Screen



Softkey Menu Field

Softkey Menu 1

- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **RF Output On/Off**: Selects the RF power output from `On` and `Off`. `RF On` is displayed at the lower left corner on screen when this is set to `On`.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous). When the trigger mode is set to `Cont`, continuous measurement starts as soon as the screen of [TX Analyzer] is displayed.
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
- **Trigger**: Starts single measurement.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Fields

Set the input fields in the screen field according to the following description of Table 5-60 to execute a new test.

Table 5-60 [TX Analyzer: Stand-by] Screen Input Field

Input Field	Description

Measuring mode	Sets whether or not to execute a group of test items.
	• Peak TX Power, Burst Timing, Power Ramp
	• Phase Error (RMS), Phase Error (Peak), Frequency Error
	  • (Above items can be measured at Demod: GMSK)
	• EVM (RMS), EVM (Peak), EVM (95%), Frequency Error, Origin Offset Spr.
	  • (Above items can be measured at Demod:8PSK, Signal: Burst, Installation of Option G03 is required.)

Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900.
RFCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Signal	Selects `CW` or `Burst` of a MS transmission signal. • `CW`: Selects this when a continuous wave is transmitted from the mobile phone. • `Burst`: Selects this when a bursted signal is transmitted from the mobile phone.

Table 5-60 [TX Analyzer: Stand-by] Screen Input Field

Input Field	Description
Modulation	Selects one of the following modulation modes: • GMSK:BCCH: Sets the data of BCCH during call connecting. • GMSK:PN9: Modulates RF signal in GMSK modulation and outputs with a 9-step pseudorandom binary sequence noise. • GMSK:PN15: Modulates RF signal in GMSK modulation and outputs with a 15-step pseudorandom binary sequence noise. • GMSK:All0: Modulates RF signal in GMSK modulation and outputs with all-zero data. • GMSK:All1: Modulates RF signal in GMSK modulation and outputs with all-one data. • 8PSK:PN9: Modulates RF signal in 8PSK modulation and outputs with 9-step pseudorandom binary sequence noise. • 8PSK:PN15: Modulates RF signal in 8PSK modulation and outputs with 15-step pseudorandom binary sequence noise. • AM: Applies AM modulation to carrier.
Offset	Sets frequency offset of the output signal. The allowable range is `-100.0` to `+100.0` kHz in `0.1` kHz resolution.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
Amplitude	Sets the RF output level of the Signal Generator. The allowable range is from `-110.0` to `-20.0` dBm in `0.1` dB steps.
Midamble †	Sets the Training Sequence Code (TSC) to `0` to `7`, or `None` for the amplitude triggering.
Demod	Sets the modulation form of the MS signal. Selects GMSK or 8PSK. Installation of Option G03 is required for 8PSK
Averaging	Displays the average value of Peak TX Power, Phase Error, and Frequency Error. Sets the averaging number from `2` to `200`, or `Off`. When this function is not required, select `Off`.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

† When `None` is selected, Phase Error/ Frequency Error cannot be measured.

The following measurement items are displayed in groups in the table. When a group of measurement items is selected with the CURSOR CONTROL knob, the Graph/Value screen for the group is displayed.

Table 5-61 TX Analyzer Measurement Item

Screen Field	Description
Peak TX Power Burst Timing Power Ramp	Measurement results of Peak TX Power, Burst Timing and Power Ramp are shown. When this field is selected, the Graph/Value screen for **Peak TX Power/ Burst Timing/ Power Ramp** is displayed with measurement results on text and graph display.
Phase Error (RMS) Phase Error (Peak) Frequency Error	Measurement results of Phase Error and Frequency Error are shown. When this field is selected, the Graph/Value screen for **Phase Error/ Frequency Error** is displayed with measurement results on text and graph display.
EVM (RMS) EVM (Peak) EVM (95%) Frequency Error Origin Offset Spr.*	Measurement result of EVM, Phase Error, and Origin Offset Spr. are shown. When this field is selected, the Graph/Value screen for **EVM/ Frequency Error/OOS** is displayed with measurement results on text and graph display.

* Installation of the Option G03 is required.

Message Field

The following message is displayed in the message field on the [Stand-by] screen:

Set mobile phone to TX mode and Press {Trigger}.

The word surrounded by {} in the message field denotes the softkey.

Explanation

Measurement starts by the following ways:

When the trigger mode is set to `Sing`,

- Press the **Trigger** softkey on the [Stand-by] screen to start single measurement.
- Press the **Trigger Sing/Cont** softkey on the [Stand-by] screen to start continuous measurement.

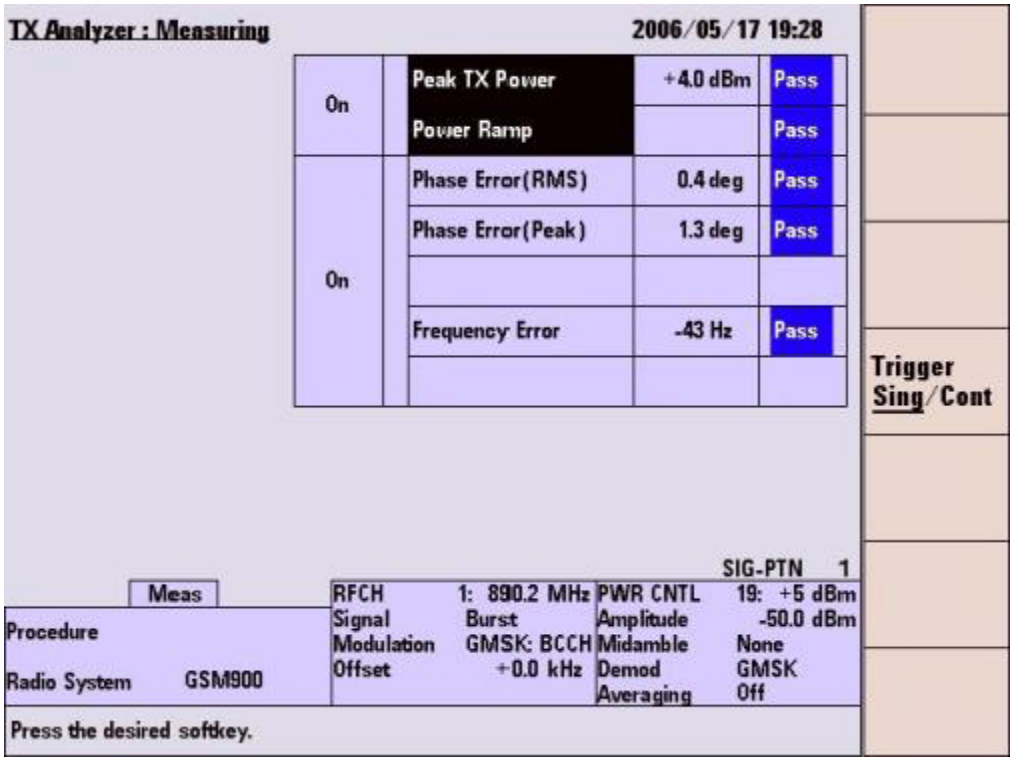
When the trigger mode is set to `Cont`,

- Continuous measurement starts on the [Measuring] screen as soon as the screen of [TX Analyzer] is displayed.

Measuring Screen

When measurement starts, the [Measuring] screen as Figure 5-64 is displayed.

Figure 5-64 [Measuring] Screen



Softkey Menu Field

Softkey Menu

- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - When the trigger mode is changed from `Sing` to `Cont`, continuous measurement starts.
  - When the trigger mode is changed from `Cont` to `Sing`, the measurement is terminated.

Message Field

The following message is displayed in the message screen on the [Measuring] screen:

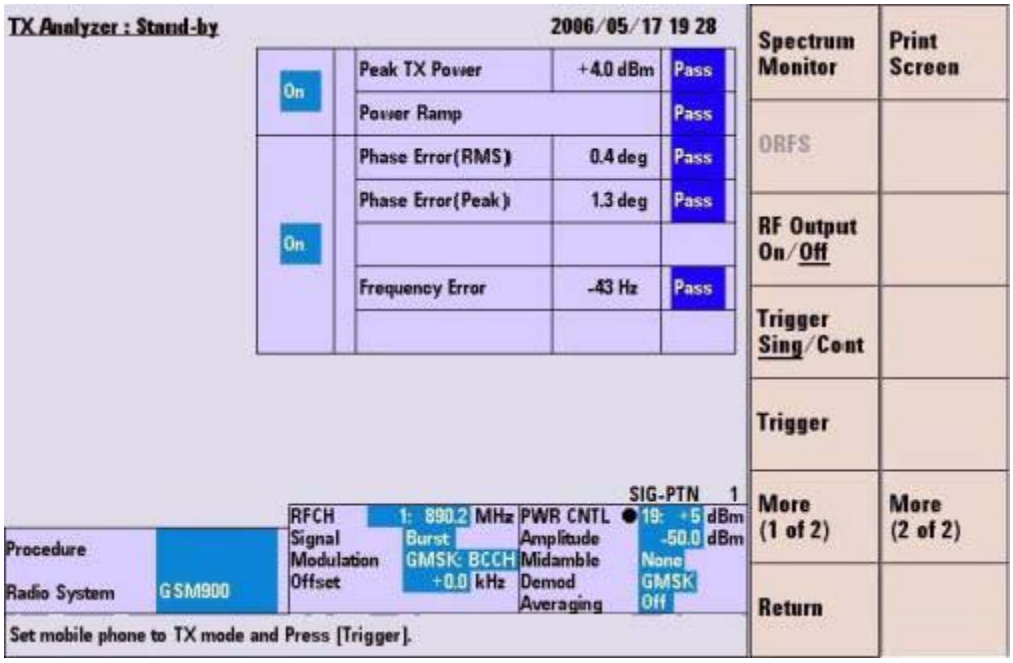
Press the desired softkey.

Summary Screen

After completion of measurement, a [Stand-by] summary screen showing measurement results is displayed.

- `Pass`: Shown on blue background when the measurement result is passed.
- `Fail`: Shown on red background when the measurement result is failed.

Figure 5-65 [Stand-by] Summary Screen



Softkey Menu Field

Softkey Menu 1

- **Spectrum Monitor**: Displays the Spectrum Monitor screen.
- **ORFS**: Displays the [Output RF spectrum] screen when Demod is set to 8PSK.

- **RF Output On/Off**: Selects the RF power output from `On` and `Off`. `RF On` is displayed at the lower left corner on screen when this is set to `On`.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
- **Trigger**: Starts single measurement.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

The input field in the screen field can be changed for a new test. Refer to Table 5-60 [TX Analyzer: Stand-by] Screen Input Field on page 139.

Procedure to obtain a Graph/Value screen

To obtain a Graph/Value from the summary screen, follow the procedure described below.

Step 1

Place the cursor at one of the test items by rotating the CURSOR CONTROL knob.

Step 2

Select the test item by pressing the CURSOR CONTROL knob.

Step 3

Either a measurement result list or a graph with a measurement result list is displayed according to each measurement item.

Graph/Value Screen

Peak TX Power/ Burst Timing/ Power Ramp

The measured data are shown in enlarged numerals.

The Power Ramp result is shown when the marker is placed at any point on its measured trace.

If the measured data exceeds the limits on the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-66[Stand-by] Peak TX Power/ Burst Timing/ Power Ramp Screen

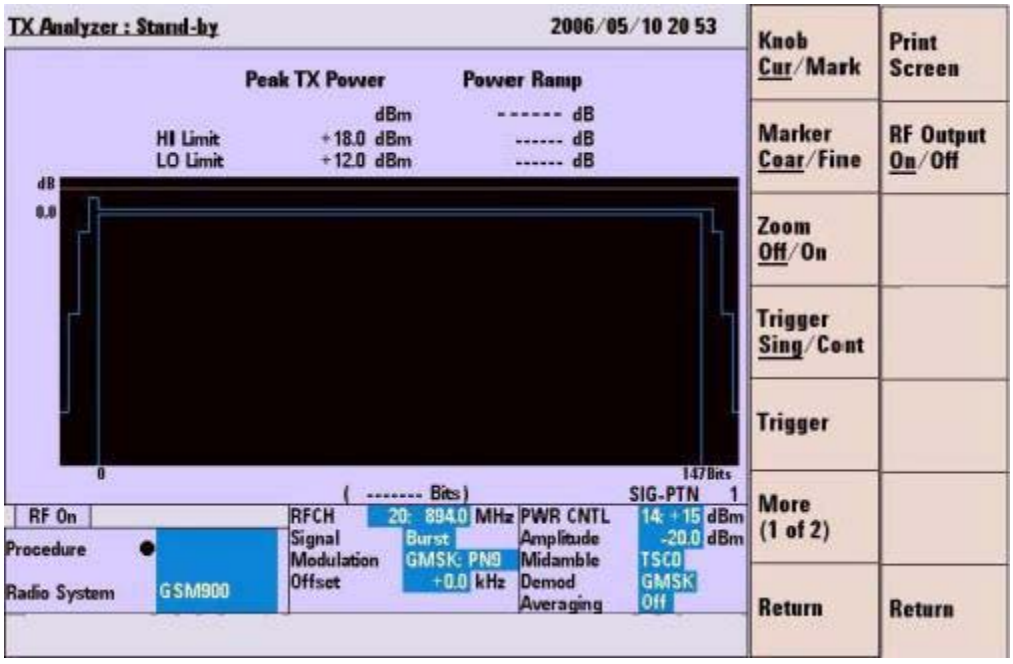
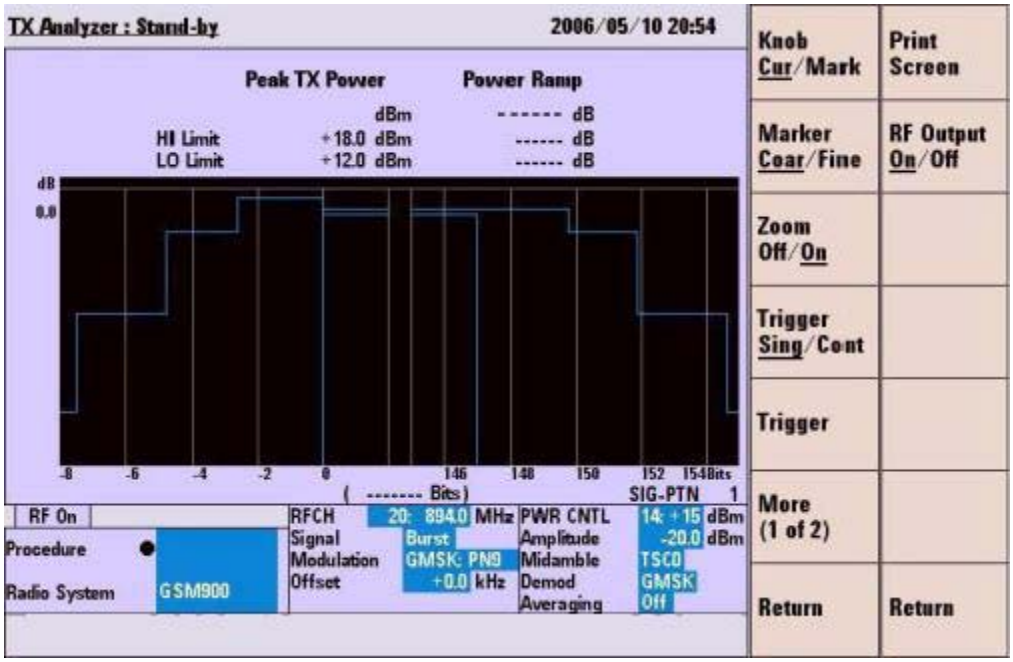


Figure 5-67[Stand-by] Peak TX Power/ Burst Timing/ Power Ramp Zoomed Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the amplitude and timeslot (in bits) is available at any point of the measured trace.
- **Zoom Off/On**: Selects the zooming function from `Off` and `On`. If `On` is selected, the rising edge, between `-8` bits and `0` bits, and trailing edge, between `147` and `155` bits, of the Power Ramp waveforms are expanded to observe the derailed test result as shown in Figure .
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).

- The `Sing` mode setting provides single measurement.
- When the trigger mode is changed from `Sing` to `Cont`, continuous measurement starts.
- The `Cont` mode setting provides continuous measurement.
- When the trigger mode is changed from `Cont` to `Sing`, the measurement is terminated.

- **Trigger**: Starts single measurement.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **RF Output On/Off**: Selects the RF power output from `On` and `Off`. `RF On` is displayed at the lower left corner on screen when this is set to `On`.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-62 [TX Analyzer] Peak TX Power/ Burst Timing/ Power Ramp Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900.

Table 5-62 [TX Analyzer] Peak TX Power/ Burst Timing/ Power Ramp Screen Input Field

Input Field	Description
RFCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
Averaging	Sets the averaging numbers of respective measurements. Sets the averaging number from 2 to 99, or Off. When this function is not required, select Off.
Midamble †	Sets the Training Sequence Code (TSC) 0 to 7, or None for the amplitude triggering.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
Amplitude *	Sets the RF output level of the Signal Generator. The allowable range is from -110.0 to -20.0 dBm in 0.1 dB steps.
Modulation	Selects one of the following modulation modes: (Installation of the Option G03 is required for 8PSK.) GMSK:BCCH: Sets the data of BCCH during call connecting. GMSK:PN9: Modulates RF signal in GMSK modulation and outputs with a 9-step pseudorandom binary sequence noise. GMSK:PN15: Modulates RF signal in GMSK modulation and outputs with a 15-step pseudorandom binary sequence noise. GMSK:All0: Modulates RF signal in GMSK modulation and outputs with all-zero data. GMSK:All1: Modulates RF signal in GMSK modulation and outputs with all-one data. 8PSK:PN9: Modulates RF signal in 8PSK modulation and outputs with 9-step pseudorandom binary sequence noise. 8PSK:PN15: Modulates RF signal in 8PSK modulation and outputs with 15-step pseudorandom binary sequence noise. AM: Applies AM modulation to carrier.
Offset *	Sets frequency offset of the output signal. The allowable range is -100.0 to +100.0 kHz in 0.1 kHz resolution.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

† When None is selected, Phase Error/ Frequency Error cannot be measured.

NOTE

If the measurement is not triggered, check the following items:

- Power Control Level (PWR CNTL) is properly set for the mobile phone.
- Midamble is properly set. If you don't know which Training Sequence Code (TSC) is used, set Midamble to `None` to use the amplitude trigger mode.

A Pass/Fail judgment is not given while transmission power is off.

The measurement results are shown in the screen field.

Table 5-63 [TX Analyzer] Peak TX Power/Burst Timing/Power Ramp Screen Field

Screen Field	Description
Peak TX Power	Measured Peak TX Power, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
Burst Timing	Measured Burst Timing, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
Power Ramp	Measured Power Ramp, the HI and the LO Limit are shown. The limits are specified by the radio system selected (template).

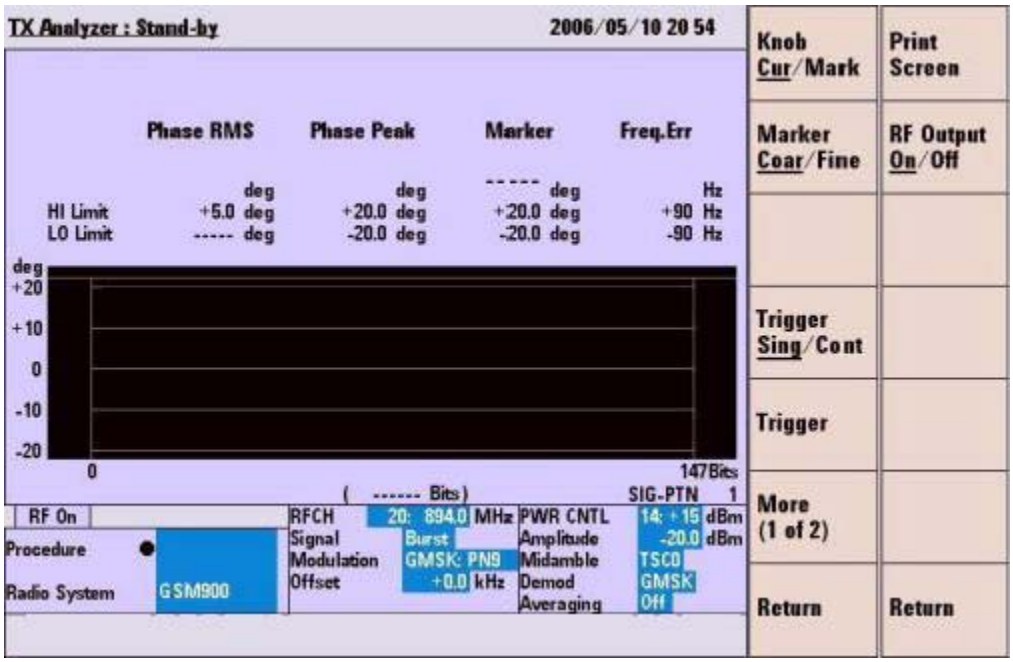
Phase Error/ Frequency Error

The RMS and Peak Phase Error and Frequency Error are shown along with the marker readout if the marker is activated.

If the measured data exceeds the limits on the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-68 [Stand-by] Phase Error/ Frequency Error Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the phase error magnitude and timeslot (in bits) is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.

    When the trigger mode is changed from `Sing` to `Cont`, continuous measurement starts.
  - The `Cont` mode setting provides continuous measurement.

When the trigger mode is changed from `Cont` to `Sing`, the measurement is terminated.

- **Trigger**: Starts single measurement.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **RF Output On/Off**: Selects the RF power output from `On` and `Off`. `RF On` is displayed at the lower left corner on screen when this is set to `On`.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-64 [TX Analyzer] Phase Error/Frequency Error Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900.
RFCH *	Sets the channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Signal	Selects `CW` or `Burst` of a MS transmission signal. • `CW`: Selects this when a continuous wave is transmitted from the mobile phone. • `Burst`: Selects this when a bursted signal is transmitted from the mobile phone.

Table 5-64 [TX Analyzer] Phase Error/Frequency Error Screen Input Field

Input Field	Description
Modulation	• Selects one of the following modulation modes: • GMSK:BCCH: Sets the data of BCCH during call connecting. • GMSK:PN9: Modulates RF signal in GMSK modulation and outputs with a 9-step pseudorandom binary sequence noise. • GMSK:PN15: Modulates RF signal in GMSK modulation and outputs with a 15-step pseudorandom binary sequence noise. • GMSK:All0: Modulates RF signal in GMSK modulation and outputs with all-zero data. • GMSK:All1: Modulates RF signal in GMSK modulation and outputs with all-one data. • 8PSK:PN9: Modulates RF signal in 8PSK modulation and outputs with 9-step pseudorandom binary sequence noise. • 8PSK:PN15: Modulates RF signal in 8PSK modulation and outputs with 15-step pseudorandom binary sequence noise. • AM: Applies AM modulation to carrier.
Offset *	Sets frequency offset of the output signal. The allowable range is `-100.0` to `+100.0` kHz in `0.1` kHz resolution.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
Amplitude *	Sets the RF output level of the Signal Generator. The allowable range is from `-110.0` to `-20.0` dBm in `0.1` dB steps.
Midamble †	Sets the Training Sequence Code (TSC) `0` to `7`, or `None` for the amplitude triggering.
Demod	Sets the modulation form of the MS signal. Selects `GMSK` or `8PSK`.
Averaging	Sets the averaging numbers of respective measurements. Sets the averaging number from `2` to `99`, or `Off`. When this function is not required, select `Off`.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

† When `None` is selected, Phase Error/ Frequency Error cannot be measured.

NOTE

If the measurement is not triggered, check the following items:

- Power Control Level (PWR CNTL) is properly set for the mobile phone.
- Midamble is properly set. If you set to `None`, Phase Error/ Frequency Error measurement cannot be performed.

The measurement items are shown in the screen field.

Table 5-65 [TX Analyzer] Phase Error/Frequency Error Screen Field

Screen Field	Description
Phase RMS	Measured Phase Error (RMS) and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
Phase Peak	Measured Phase Error (Peak), the HI and the LO Limit are shown. A set of the HI the LO Limit is set on the [Configuration: Test Condition] screen.
Marker	Measured Phase Error at the marker position, the HI and the LO Limit are shown. Measured data is shown when the marker is placed on the measurement trace. The HI Limit is set on the [Configuration: Test Condition] screen.
Freq. Err	Measured Frequency Error, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

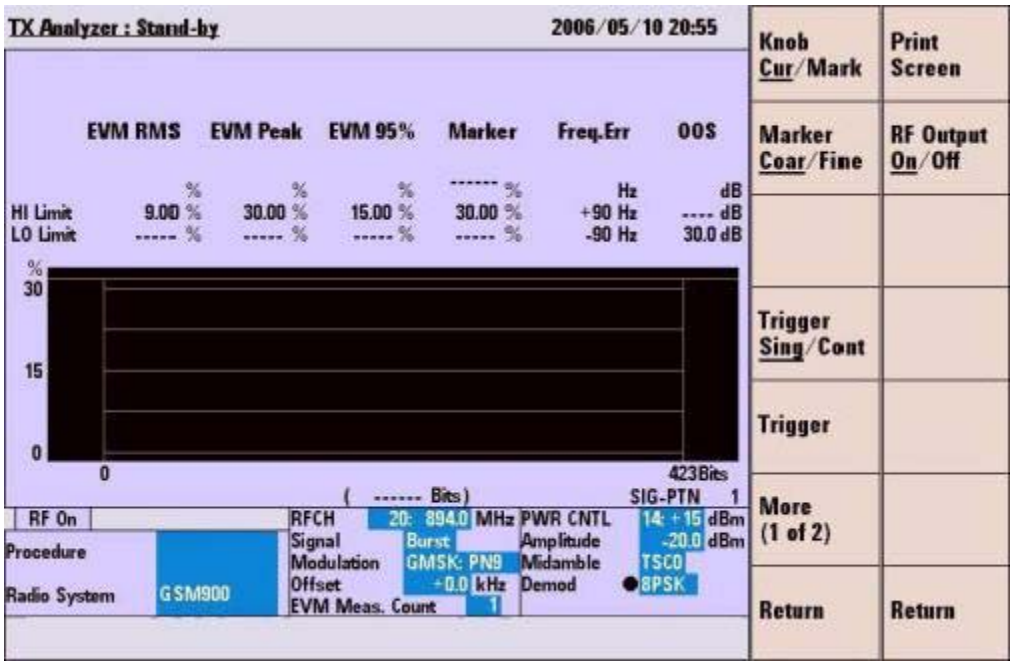
EVM

The RMS, Peak, 95 %, Frequency Error, and Origin Offset are shown along with the marker readout if the marker is activated.

If the measured data exceeds the limits on the graph, one or more white triangle markers indicate the failed position at the top of the graph frame.

Any data indicating a failure is highlighted.

Figure 5-69 [Stand-by] EVM Frequency Error/OOS Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the phase error magnitude and timeslot (in bits) is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.

- To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
- This softkey is effective only for changing the trigger mode on the [Stand-by] screen.

- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **RF Output On/Off**: Selects the RF power output from `On` and `Off`. **RF On** is displayed at the lower left corner on screen when this is set to `On`.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-66 [TX Analyzer] EVM/Frequency Error/OOS Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900.
RFCH *	Sets the channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Signal	Selects `CW` or `Burst` of a MS transmission signal. • `CW`: Selects this when a continuous wave is transmitted from the mobile phone. • `Burst`: Selects this when a bursted signal is transmitted from the mobile phone.

Table 5-66 [TX Analyzer] EVM/Frequency Error/OOS Screen Input Field

Input Field	Description
Modulation	Selects one of the following modulation modes: • GMSK:BCCH: Sets the data of BCCH during call connecting. • GMSK:PN9: Modulates RF signal in GMSK modulation and outputs with a 9-step pseudorandom binary sequence noise. • GMSK:PN15: Modulates RF signal in GMSK modulation and outputs with a 15-step pseudorandom binary sequence noise. • GMSK:All0: Modulates RF signal in GMSK modulation and outputs with all-zero data. • GMSK:All1: Modulates RF signal in GMSK modulation and outputs with all-one data. • 8PSK:PN9: Modulates RF signal in 8PSK modulation and outputs with 9-step pseudorandom binary sequence noise. • 8PSK:PN15: Modulates RF signal in 8PSK modulation and outputs with 15-step pseudorandom binary sequence noise. • AM: Applies AM modulation to carrier.
Offset *	Sets frequency offset of the output signal. The allowable range is `-100.0` to `+100.0` kHz in `0.1` kHz resolution.
EVM Meas. Count	Sets Measurement Burst during EVM test, ranging from `1` to `200`.
PWR CNTL	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
Amplitude *	Sets the RF output level of the Signal Generator. The allowable range is from `-110.0` to `-20.0` dBm in `0.1` dB steps.
Midamble †	Sets the Training Sequence Code (TSC) `0` to `7`, or `None` for the amplitude triggering.
Demod	Sets the modulation form of the MS signal. Selects `GMSK` or `8PSK`.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

† When `None` is selected, Phase Error/ Frequency Error cannot be measured.

NOTE

Installation of the Option G03 is required to display [EVM] screen.

If the measurement is not triggered, check the following items:

- Power Control Level (PWR CNTL) is properly set for the mobile phone.
- Midamble is properly set. If you set to `None`, Phase Error/ Frequency Error measurement cannot be performed.
- When `Demod` is set to GMSK, the displayed screen may not be the [EVM] screen, but the [Phase Error/Frequency Error screen

The measurement items are shown in the screen field.

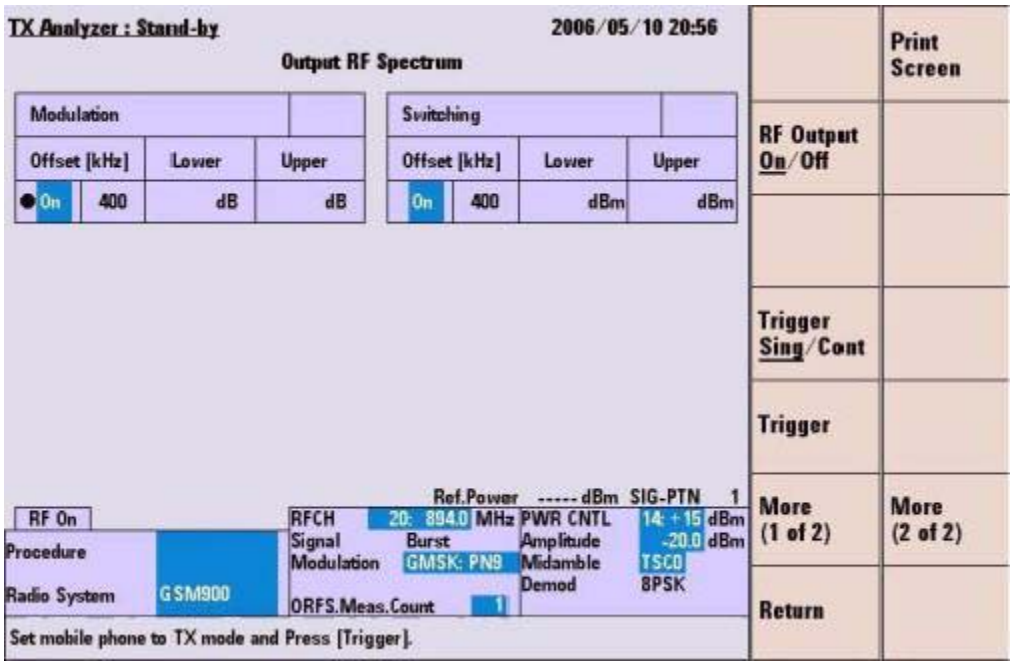
Table 5-67 [TX Analyzer] EVM/Frequency Error/OOS Screen Field

Screen Field	Description
EVM RMS	Measured EVM (RMS) and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
EVM Peak	Measured EVM (Peak), the HI and the LO Limit are shown. A set of the HI and the LO Limit is set on the [Configuration: Test Condition] screen.
EVM 95%	Measured EVM (95%) and the HI Limit are shown. The HI Limit is set on the [Configuration: Test Condition] screen.
Marker	Measured Phase Error at the marker position, the HI and the LO Limit are shown. Measured data is shown when the marker is placed on the measurement trace. The HI Limit is set on the [Configuration: Test Condition] screen.
Freq. Err	Measured Frequency Error, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.
OOS	Measured Origin Offset, the HI and the LO Limit are shown. The HI and the LO Limit are set on the [Configuration: Test Condition] screen.

Output RF Spectrum (ORFS)

The power of the adjacent channels can be measured. The screen of the Output RF Spectrum (ORFS) shows the measurement result of the Modulation and Switching at the carrier frequency rate of –400 kHz and +400 kHz.

Figure 5-70 [Output RF Spectrum] Screen



Softkey Menu Field

Softkey Menu 1

- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.
  - The `Cont` mode setting provides continuous measurement.
  - To start continuous measurement on the [Measuring] screen, change the trigger mode from `Sing` to `Cont`.
  - To terminate continuous measurement on the [Measuring] screen, change the trigger mode from `Cont` to `Sing`.
  - This softkey is effective only for changing the trigger mode on the [Stand-by] screen.
- **Trigger**: Starts single measurement. This softkey is inactivated on the [Stand-by] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

Set the input fields of the following parameters to execute a new test.

Table 5-68 [TX Analyzer] EGPRS Mode ORFS Screen Input Field

Input Field	Description
Measuring mode	Sets whether or not to execute each group of test items. Select `On` or `Off`. • Modulation • Switching
Procedure	Displays a list of parameter file names stored in the Tester. Select a file to recall for a test. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900. This field cannot be changed on the [Measuring] screen.
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810` This field cannot be changed on the [Measuring] screen.
PDTCH *	Sets a packet data traffic channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
ORFS.Meas. Count	Sets Measurement Burst during ORFS test, ranging from `1` to 200.

Table 5-68 [TX Analyzer] EGPRS Mode ORFS Screen Input Field

Input Field	Description
PWR CNTL *	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
BS Level *	Sets the RF output level of the Tester. The allowable range is from -110.0 to -50.0 dBm in 0.1 dB steps.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The measurement result is displayed in the screen field.

Table 5-69 [Manual Test] EGPRS Mode ORFS Screen Field

Screen Field	Description
Modulation	Displays measured Modulation value of carrier frequency at +400 kHz (Upper) and –400 kHz (Lower).
Switching	Displays measured Switching transient value of carrier frequency at +400 kHz (Upper) and –400 kHz (Lower).
Modulation Type	The Modulation Type is shown.
Ref. Power	The power at the time of measurement is shown.

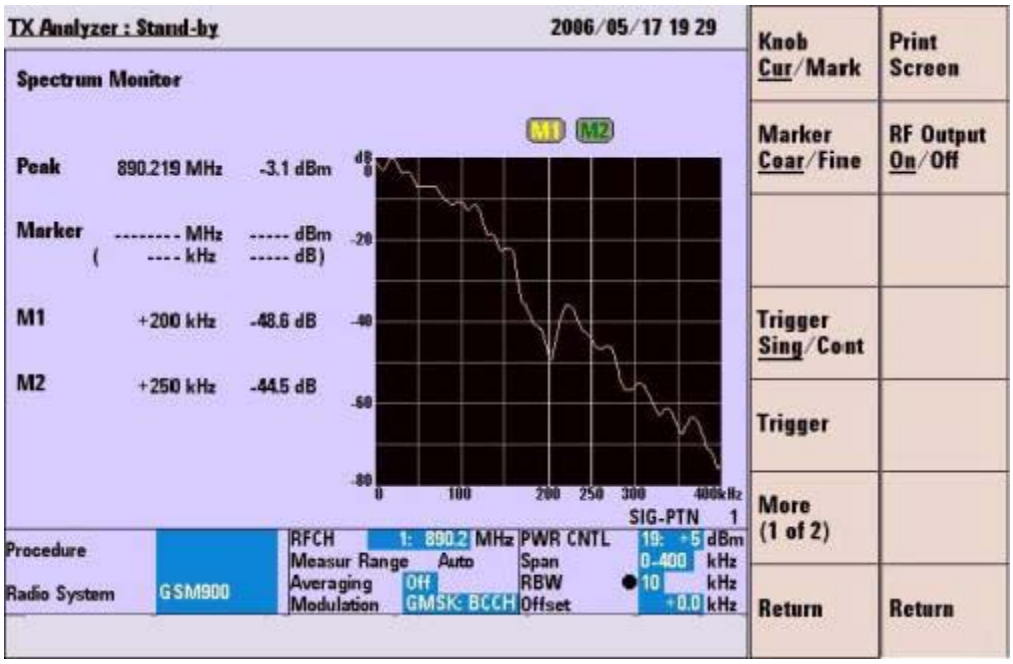
NOTE Installation of the Option G03 is required to display [Output RF Spectrum] screen.

Spectrum Monitor

The RF spectrum from fc to fc + 400 kHz relative to the RFCH frequency is shown with the readout of the frequencies and amplitudes at +200.0 kHz (M1) and +250.0 kHz (M2) offsets. Or, the RF spectrum of fc 100 kHz relative to the RFCH frequency is shown with the readout of the frequencies and amplitudes at –67.7 kHz (M1), ±0.0 kHz (M2) and +67.7 kHz (M3) offsets.

The measured data at those frequencies are shown.

Figure 5-71 [Stand-by] Spectrum Monitor Span 0 - 400kHz Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the phase error magnitude and timeslot (in bits) is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.

    When the trigger mode is changed from `Sing` to `Cont`, continuous measurement starts.

- The `Cont` mode setting provides continuous measurement.

  When the trigger mode is changed from `Cont` to `Sing`, the measurement is terminated.

- **Trigger**: Starts single measurement.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **RF Output On/Off**: Selects the RF power output from `On` and `Off`. **RF On** is displayed at the lower left corner on screen when this is set to `On`.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Field

The measurement results as Table 5-70 is shown.

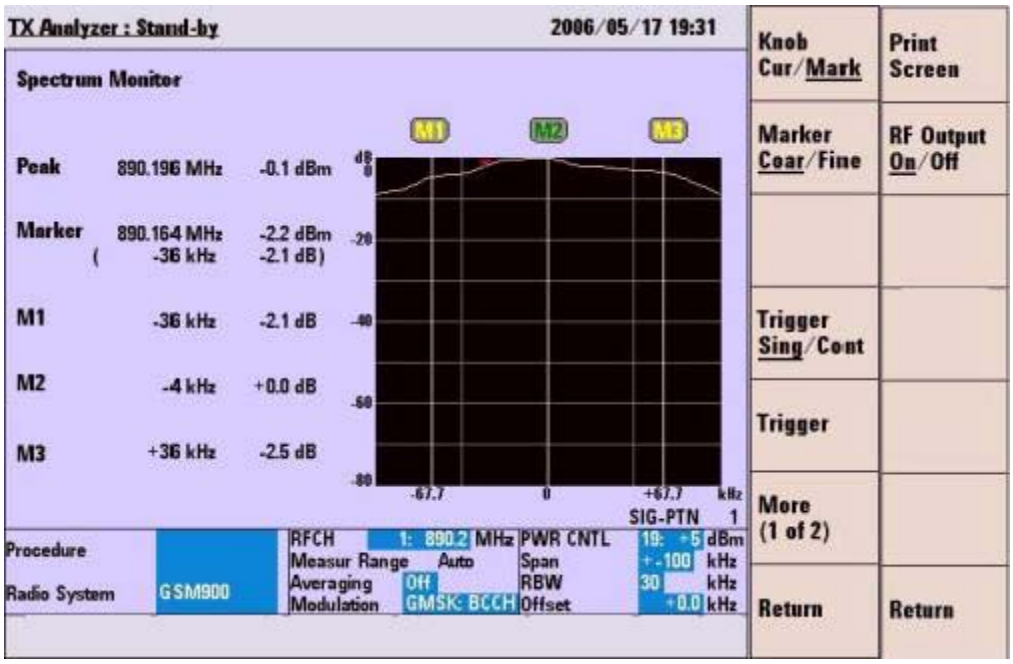
Table 5-70 [TX Analyzer] Spectrum Monitor (span 0 - 400kHz) Screen Field

Screen Field	Description
Peak	The absolute peak power and frequency are shown.
Marker *	The readout of frequency and amplitude at the marker position is shown as follows when the marker is activated by the **Knob Cur/Marker** softkey setting: • ——— MHz —— dBm: The absolute frequency and amplitude at the marker position are shown. • (—— kHz —— dB): The relative frequency and amplitude the marker position are shown.
M1: +200kHz M2: +250kHz	The amplitude at +200 kHz and +250 kHz offsets relative to the RFCH frequency are shown.

* The resolution of the marker on the screen is not equivalent to the measurement resolution.

Figure 5-72 is the [Stand-by] Spectrum Monitor screen for span +-100 kHz.

Figure 5-72 [Stand-by] Spectrum Monitor Span +-100kHz Screen



Softkey Menu Field

Softkey Menu 1

- **Knob Cur/Marker**: Selects the function of the CURSOR CONTROL knob from `Cur` (cursor) and `Marker`.
- **Marker Coar/Fine**: Selects the marker control from `Coar` (coarse) and `Fine` to move the marker with 10 dots (coarse) or 1 dot (fine) resolution. The marker readout for the phase error magnitude and timeslot (in bits) is available at any point of the measured trace.
- **Trigger Sing/Cont**: Selects the trigger mode from `Sing` (single) and `Cont` (continuous).
  - The `Sing` mode setting provides single measurement.

    When the trigger mode is changed from `Sing` to `Cont`, continuous measurement starts.

- The `Cont` mode setting provides continuous measurement.

  When the trigger mode is changed from `Cont` to `Sing`, the measurement is terminated.

- **Trigger**: Starts single measurement.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the previous screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **RF Output On/Off**: Selects the RF power output from `On` and `Off`. `RF On` is displayed at the lower left corner on screen when this is set to `On`.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Fields

The measurement results Table 5-71 as is shown.

Table 5-71 [TX Analyzer] Spectrum Monitor (span +-100kHz) Screen Field

Screen Field	Description
Peak	The absolute peak power and frequency are shown.
Marker *	The readout of frequency and amplitude at the marker position is shown as follows when the marker is activated by the **Knob Cur/Marker** softkey setting: • ——— MHz —— dBm: The absolute frequency and amplitude at the marker position are shown. • (—— kHz —— dB): The relative frequency and amplitude the marker position are shown.
M1: –67.7kHz M2: 0.0kHz M3: +67.7kHz	The peak amplitudes around M1 (–67.7 kHz), M2 (0.0 kHz), and M3 (+67.7 kHz) relative to the RFCH frequency offsets are shown.

* The resolution of the marker on the screen is not equivalent to the measurement resolution.

Set the input fields of the following parameters to execute a new test.

Table 5-72 [TX Analyzer] Spectrum Monitor Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900.
RFCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Measur Range	Fixed to `Auto`.
Averaging	Sets the averaging numbers of respective measurements. Sets the averaging number from `2` to `99`, or `Off`. When this function is not required, select `Off`.
Modulation	Selects one of the following modulation modes: • GMSK:BCCH: Sets the data of BCCH during call connecting. • GMSK:PN9: Modulates RF signal in GMSK modulation and outputs with a 9-step pseudorandom binary sequence noise. • GMSK:PN15: Modulates RF signal in GMSK modulation and outputs with a 15-step pseudorandom binary sequence noise. • GMSK:All0: Modulates RF signal in GMSK modulation and outputs with all-zero data. • GMSK:All1: Modulates RF signal in GMSK modulation and outputs with all-one data. • 8PSK:PN9: Modulates RF signal in 8PSK modulation and outputs with 9-step pseudorandom binary sequence noise. • 8PSK:PN15: Modulates RF signal in 8PSK modulation and outputs with 15-step pseudorandom binary sequence noise. • AM: Applies AM modulation to carrier.
PWR CNTL *	Sets one of the factors defined for Power Control Levels according to the Radio System. The allowable range is as follows: GSM850, GSM900: `2` to `19` (+39dBm to +5dBm) DCS1800: `29` to `15` (+36dBm to 0dBm) PCS1900: `30` to `15` (+33dBm to 0dBm) Set the **MS Power Class** on the [Configuration: Test Condition] screen for the power class of the mobile phone. If the mobile phone does not support the power control function, measurement result is not displayed.
Span	Sets Span to `0-400` or `±100`. • `0-400`: f_c to f_c + 400 kHz • `±100`: f_c ±100 kHz

Table 5-72 [TX Analyzer] Spectrum Monitor Screen Input Field

Input Field	Description
RBW	Selects either `10` kHz or `30` kHz resolution bandwidth as follows: • `10`: Sets the resolution bandwidth to 10 kHz. • `30`: Sets the resolution bandwidth to 30 kHz.
Offset	Sets frequency offset of the output signal. The allowable range is `-100.0` to `+100.0` kHz in `0.1` kHz resolution.

* The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

Signal Generator

Feature of Signal Generator

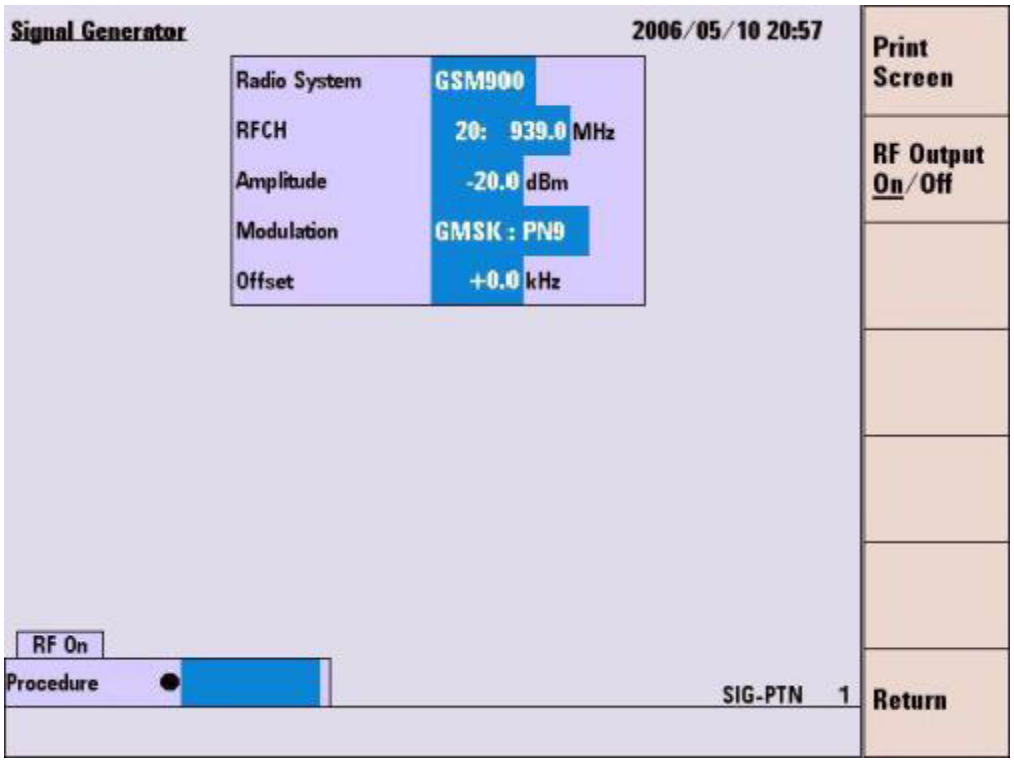
The Tester is capable to generate RF signal dedicated to the radio system GSM850, GSM900, DCS1800, and PCS1900.

NOTE

For numeric value entry, the changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

When the **Signal Generator** softkey is pressed on the [Initial], the [Signal Generator] screen as Figure 5-73 is displayed.

Figure 5-73 [Signal Generator] Screen



Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **RF Output**: Selects the RF power output from `On` and `Off`. `RF On` is shown at the lower left corner of screen when this softkey is set to `On`.
- **Return**: Returns to the [Initial] screen.

Screen Fields

Set the input fields to generate RF signal from the Tester according to the following description of Table 5-73.

Table 5-73 [Signal Generator] Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.
Radio System	Selects a radio system from GSM850, GSM900, DCS1800 and PCS1900.
RFCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: 128 to 251 GSM900: 0 to 124 and 955 to 1023 DCS1800: 512 to 885 PCS1900: 512 to 810
Amplitude	Sets the RF output level. The allowable range is from -110.0 to -20.0 dBm in 0.1 dB steps.
Modulation	Selects one of the following modulation modes: • GMSK:BCCH: Sets the data of BCCH during call connecting. • GMSK:PN9: Modulates RF signal in GMSK modulation and outputs with a 9-step pseudorandom binary sequence noise. • GMSK:PN15: Modulates RF signal in GMSK modulation and outputs with a 15-step pseudorandom binary sequence noise. • GMSK:All0: Modulates RF signal in GMSK modulation and outputs with all-zero data. • GMSK:All1: Modulates RF signal in GMSK modulation and outputs with all-one data. • 8PSK:PN9: Modulates RF signal in 8PSK modulation and outputs with 9-step pseudorandom binary sequence noise. • 8PSK:PN15: Modulates RF signal in 8PSK modulation and outputs with 15-step pseudorandom binary sequence noise. • AM: Applies AM modulation to carrier.
Offset *	Sets frequency offset of the output signal. The allowable range is -100.0 to +100.0 kHz in 0.1 kHz resolution.

* The toggling magnification softkey menu is displayed. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

Configuration

Feature of Configuration

In this mode, there are four major functions as follows:

Configuration

Test Sequence Configuration

Test Condition Configuration

File Management

NOTE

For numeric value entry, the changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

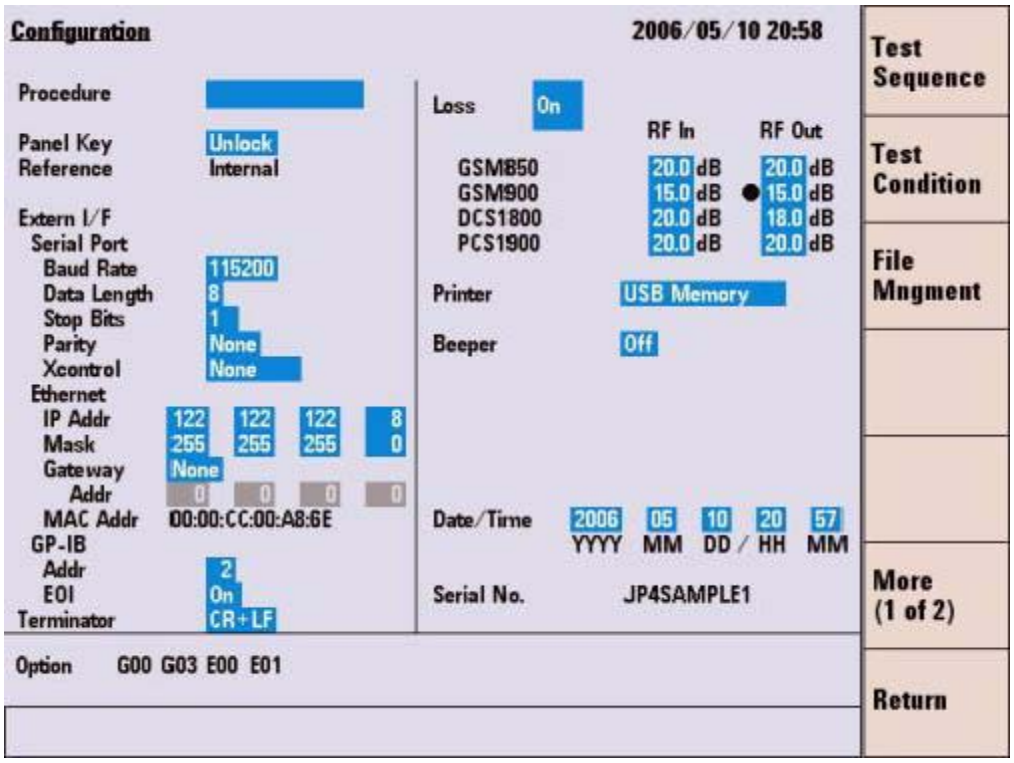
Configuration Screen

When the **Configuration** softkey is pressed on the [Initial] screen, the [Configuration] screen as Figure 5-74 is displayed.

The following various condition are set on the [Configuration] screen:

- Execution sequence of Automatic Test
- Test parameters
- Relevant to I/F
- Other setting

Figure 5-74 [Configuration] Screen



Softkey Menu Field

Softkey Menu 1

- **Test Sequence**: Go to the [Configuration: Test Sequence] screen.
- **Test Condition**: Go to the [Configuration: Test Condition] screen.
- **File Management**: Go to the [Configuration: File Management] screen.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Initial] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **More (2 of 2)**: Returns to the softkey menu 1.

Screen Fields

Set the input fields to use the Tester according to the following description of Table 5-74.

Table 5-74 [Configuration] Screen Input Field

Input Field	Description
Procedure	Displays a list of parameter file names stored in the Tester. If the Tester is using a parameter file, the file name is displayed in this field. If the Tester contains parameter files, a list of those filename is displayed in this field for selection.

Panel Key	Restricts the acceptance of system setting on the front panel of the Tester.
	Selects `Lock` or `Unlock`.
	• `Lock`: The following functions are unavailable.
	  • Manual Test, TX Analyzer, Signal Generator
	  • TCH and BCCH in Automatic Test
	  • Test Sequence, Test Condition, and File Management in the Configuration mode.
	• `Unlock`: No restriction for setting on the front panel of the Tester.

Table 5-74 [Configuration] Screen Input Field

Input Field	Description
Reference	Displays the current reference signal source. The reference signal source cannot be changed on this screen. Change this on the [Configuration] screen obtained from the [Top Menu] screen. Refer to Top Menu Screen on page 3. • Internal: Uses the internal 10 MHz reference signal. • External: Uses the external 10 MHz reference signal. The external 10MHz reference signal must be supplied to the 10 MHz reference IN connector on the rear panel.
Serial Port	Sets the serial (RS-232C) port communication condition to use external control. This function is unavailable without E00/E01 option. • Baud Rate: Sets communication speed to 9600, 19200, 38400, 57600 or 115200 bits per second. • Data Length: Sets data bit length to 7 or 8 bits. • Stop Bits: Sets stop bit length to 1, 1.5 or 2 bits. • Parity: Sets parity check mode to None, Odd or Even. • Xcontrol: Sets flow control to None or Xon/Xoff.
Ethernet *	• IP Addr: Sets IP Address. The allowable range is from 0.0.0.0 to 255.255.255.255. • Mask: Sets Subnet mask. The allowable range is from 0.0.0.0 to 255.255.255.255. Reboot the Tester after changing Ethernet setting.

GP-IB *	Sets GP-IB. This function is unavailable without E00/E01 option.
	• Address: Sets the address. The allowable range is from 1 to 15.
	• EOI: Sets EOI control. Select On or Off.
	  • On: Enables EOI control. (Terminate character is invalid).
	  • Off: Disables EOI control. (Terminate character is valid).
	Reboot the Tester after changing GP-IB setting.

Terminator	Sets a terminator of output text data to CR, LF or CR+LF. This is the Terminator outputted from the Tester. This setting is used for remote control with Serial, Ethernet and GP-IB. (The Terminator of input text data is LF)
Date/ Time *	Sets the current date and time in the following formats: YYYY: Sets the year. The allowable range is from 1990 to 2037. MM: Sets the month. The allowable range is from 01 to 12. DD: Sets the day. The allowable range is from 01 to 31. HH: Sets the hour. The allowable range is from 00 to 23. MM: Sets the minute. The allowable range is from 00 to 59.

Table 5-74 [Configuration] Screen Input Field

Input Field	Description
Loss *	Sets the path losses caused by the coupler or cable used to connect the RF signals from/to the mobile phone with each radio systems, respectively. Selects `On` or `Off`. • `On`: Adds a set path loss value of RF In/Out. Select `On` to activate the change of ATT setting on the [Configuration: Test Sequence] screen. • `Off`: Not add the path loss value. Depending on transmitter testing and receiver testing, set loss values in the `RF In` and `RF Out` fields as follows: • `RF In`: Sets the traffic channel loss values for transmitter testing. The allowable range is from `0.0` to `99.9` dB in `0.1` dB steps. • `RF Out`: Sets the traffic channel loss for receiver testing. The allowable range is from `0.0` to `99.9` dB in `0.1` dB steps. The sum of Loss setting value and ATT setting value should be more than or equal to 0. The value less than 0 is ineffective. Refer to Actual Input/Output Level and Correction on page 17.
Printer	Sets the output direction of print screen to `USB Memory` or `EPSON PM-G800`. • `USB Memory`: Saves a graphic file of screen in a USB memory device. The image format is PNG. • `EPSON PM-G800`: Prints a hardcopy of screen in the specified printer.
Beeper	Sets beep. Selects `On` or `OFF`. • `On`: Beeps for each step of operation. • `OFF`: Beeps are suppressed.
Serial No.	Displays the serial number of the Tester.

* The toggling magnification softkey menu is displayed. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

Also, the following information is shown in the screen field:

- MAC Address
- Serial No.
- Option: Displays the option number(s) which is/are installed in the Tester.

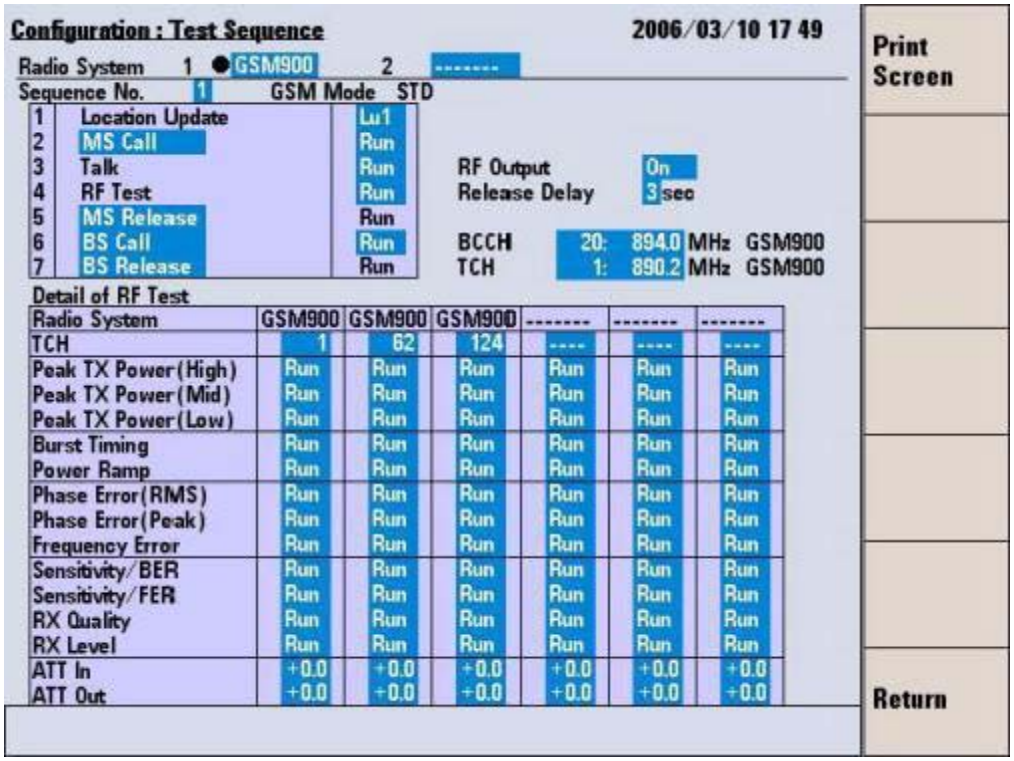
Configuration: Test Sequence Screen

When the **Test Sequence** softkey on the [Configuration] screen is pressed, the [Configuration: Test Sequence] screen as Figure 5-75 is displayed.

Configure a test sequence for executing Automatic Test on this screen.

The attenuation values set on the [Configuration] screen are used for compensating the path losses between the mobile phone and the Tester for each radio system; however, if the attenuation has frequency or channel dependency in one radio system, you can correct the RF test results with the attenuation values set on this screen.

Figure 5-75 [Configuration: Test Sequence] Screen


Configuration : Test Sequence
2006/03/10 17 49
Radio System 1 GSM900 2 -------
Sequence No. 1 GSM Mode STD
1 Location Update Lu1
2 MS Call Run
3 Talk Run
4 RF Test Run
5 MS Release Run
6 BS Call Run
7 BS Release Run
RF Output On
Release Delay 3 sec
BCCH 20: 894.0 MHz GSM900
TCH 1: 890.2 MHz GSM900
Detail of RF Test
Radio System GSM900 GSM900 GSM900 ------- ------- -------
TCH 1 62 124 ---- ---- ----
Peak TX Power(High) Run Run Run Run Run Run
Peak TX Power(Mid) Run Run Run Run Run Run
Peak TX Power(Low) Run Run Run Run Run Run
Burst Timing Run Run Run Run Run Run
Power Ramp Run Run Run Run Run Run
Phase Error(RMS) Run Run Run Run Run Run
Phase Error(Peak) Run Run Run Run Run Run
Frequency Error Run Run Run Run Run Run
Sensitivity/BER Run Run Run Run Run Run
Sensitivity/FER Run Run Run Run Run Run
RX Quality Run Run Run Run Run Run
RX Level Run Run Run Run Run Run
ATT In +0.0 +0.0 +0.0 +0.0 +0.0 +0.0
ATT Out +0.0 +0.0 +0.0 +0.0 +0.0 +0.0
Print Screen
Return

Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Return**: Returns to the [Configuration] screen.

Automatic Test Flow

For setting a test flow to execute Automatic Test, refer to the following itemized explanation and Table 5-75.

- For **Location Update**:

  Select `Lu1` to execute MS Power On Location Update, `Lu2` to execute BS Change Location Update, or `---` to skip the step in the test flow.

- For **Call** and **Release**:

  Select `BS` or `MS`.

- For other steps:

  Select `Run` to execute the step or — to skip the step in the test flow.

Table 5-75 Setting Combination for Automatic Test Flow

Step	Sequence	Test							
1	Location Update	Lu1/Lu2	Lu1/Lu2	Lu1/Lu2	Lu1/Lu2	—	—	—	—
2	MS Call/BS Call	Run	Run	—	—	Run	Run	—	—
3	Talk	Run/—	Run/—	—	—	Run/—	Run/—	—	—
4	RF Test	Run/—	Run/—	—	—	Run/—	Run/—	—	—
5	MS Release/BS Release	Run	Run	—	—	Run	Run	—	—
6	MS Call/BS Call	Run	—	Run	—	Run	—	Run	—
7	MS Release/BS Release	Run	—	Run	—	Run	—	Run	—

Screen Fields

Set the input fields of the following parameters for a new test sequence for executing Automatic Test.

Table 5-76 [Configuration: Test Sequence] Screen Input Field

Input Field	Description
Test items	Specifies execution or skip at each step. Refer to Table 5-75 on the page 174.
Radio System	Selects the radio system of sequence 1 at `1:`, and sequence 2 at `2:` from GSM850, GSM900, DCS1800 and PCS1900.
Sequence No	Sets the sequence number to set test items.
RF Output	Sets the RF output for Automatic Test. Select `Auto` or `On`. • `Auto`: Outputs RF signal only during measurement. • `On`: Outputs RF signal while an [Automatic Test] screen is displayed.
Release Delay	Sets the delay time from completion of the first release to start of second call in Automatic Test flow. The allowable range is from `0` to `9` sec in `1` sec step.

Table 5-76 [Configuration: Test Sequence] Screen Input Field

Input Field	Description
BCCH *	Sets the broadcast control channel number. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
TCH *	Sets the traffic channel number for Talk step. The allowable range is as follows: GSM850: `128` to `251` GSM900: `0` to `124` and `955` to `1023` DCS1800: `512` to `885` PCS1900: `512` to `810`
Detail of RF Test	**TCH:** Sets up to six traffic channels number. The allowable range is as follows: • GSM850: 128 to 251 • GSM900: 0 to 124 and 955 to 1023 • DCS1800: 512 to 885 • PCS1900: 512 to 810 **RF Test item:** Sets execution or skip of Pass/Fail test. Refer to Table 5-77 for details. **ATT In and ATT Out:** Sets the insertion losses caused by the coupler or cable connecting the RF signals from/to the mobile phone. Depending on transmitter and receiver testing it is required to set loss values in the **ATT In** and **ATT Out** fields as follows: • **ATT In**: Sets the traffic channel attenuation values for transmitter testing. The allowable range is from `-9.9` to `+9.9` dB in `0.1` dB steps. • **ATT Out**: Sets the traffic channel attenuation for receiver testing. The allowable range is from `-9.9` to `+9.9` dB in `0.1` dB steps. The sum of Loss setting value and ATT setting value should be greater than 0. The value less than 0 is ineffective. Refer to Actual Input/Output Level and Correction on page 17. Set **Loss** to `On` on the [Configuration] screen to activate the change of ATT setting.

* The toggling magnification softkey menu is displayed. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

The following measurement items need to be set to `Run` to execute a Pass or Fail test or to — (skip) to skip a Pass/Fail test, for each channel, respectively.

Table 5-77 Configuration: Test Sequence Measurement Item

Measurement Item	Description
Peak TX Power (High, Mid, Low)	Sets execution or skip the Peak TX Power test for the High, Mid, and Low levels. The MS power class and the power control levels for the High, Mid, and Low levels are defined on the [Configuration: Test Condition] screen.
Burst Timing	Sets execution or skip the Burst Timing test.
Power Ramp	Sets execution or skip the Power Ramp test.
Phase Error (RMS, Peak)	Sets execution or skip the Phase Error test.
Frequency Error	Sets execution or skip the Frequency Error test.
Sensitivity (BER, FER)	Sets execution or skip the Sensitivity test in BER and FER. The BS level and the number of test frames are defined in the [Configuration: Test Condition] screen.
RX Quality	Sets execution or skip the RX Quality test.
RX Level	Sets execution or skip the RX Level test.

Configuration: Test Condition Screen

When the **Test Condition** softkey on the [Configuration] screen is pressed, the [Configuration: Test Condition] screen as Figure 5-76 for GSM mode or Figure 5-77 for GPRS mode is displayed depending on the setting of **GSM Mode** setting.

Figure 5-76 [Configuration: Test Condition] (GSM Mode) Screen

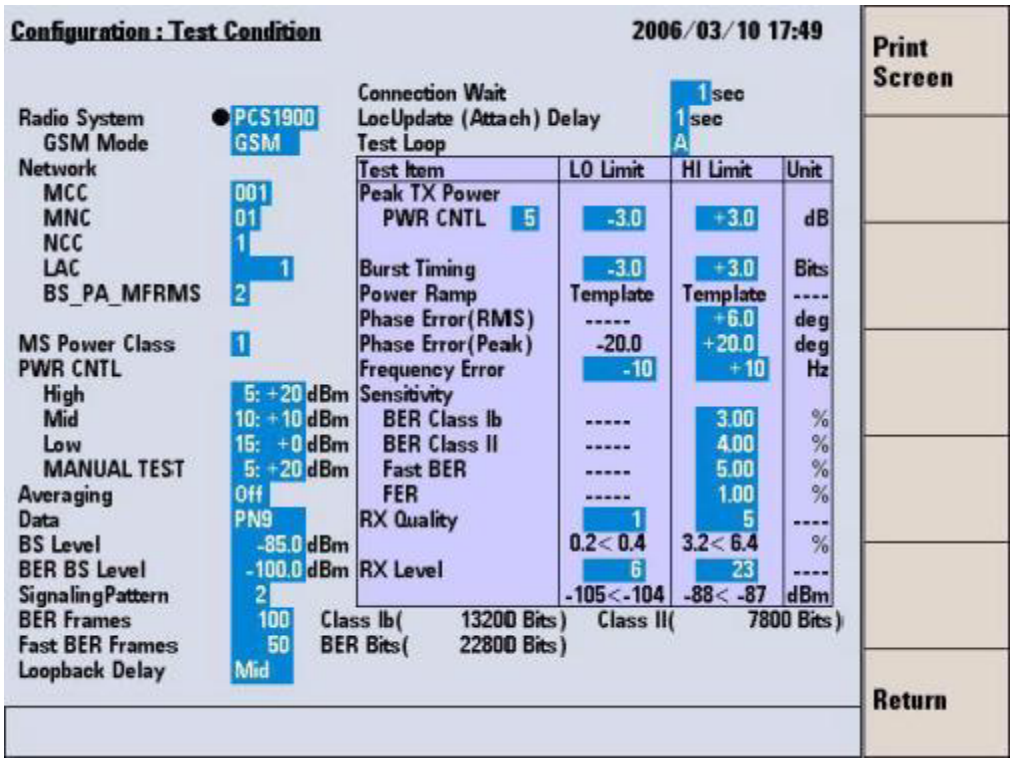
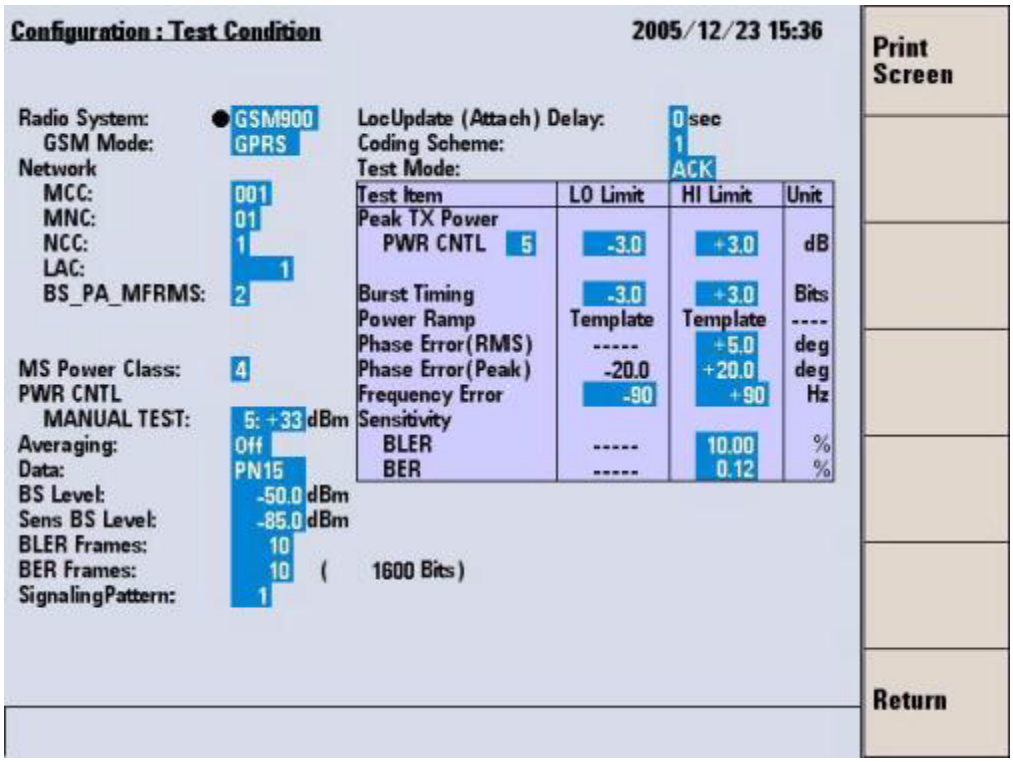

Configuration : Test Condition
2006/03/10 17:49
Print Screen
Return
Radio System PCS1900
GSM Mode GSM
Network
MCC 001
MNC 01
NCC 1
LAC 1
BS_PA_MFRMS 2
MS Power Class 1
PWR CNTL
High 5: +20 dBm
Mid 10: +10 dBm
Low 15: +0 dBm
MANUAL TEST 5: +20 dBm
Averaging Off
Data PN9
BS Level -85.0 dBm
BER BS Level -100.0 dBm
SignalingPattern 2
BER Frames 100
Fast BER Frames 50
Loopback Delay Mid
Connection Wait 1 sec
LocUpdate (Attach) Delay 1 sec
Test Loop A
Test Item | LO Limit | HI Limit | Unit
Peak TX Power
PWR CNTL 5 | -3.0 | +3.0 | dB
Burst Timing | -3.0 | +3.0 | Bits
Power Ramp | Template | Template | ----
Phase Error(RMS) | ----- | +6.0 | deg
Phase Error(Peak) | -20.0 | +20.0 | deg
Frequency Error | -10 | +10 | Hz
Sensitivity
BER Class Ib | ----- | 3.00 | %
BER Class II | ----- | 4.00 | %
Fast BER | ----- | 5.00 | %
FER | ----- | 1.00 | %
RX Quality | 1 | 5 | ----
0.2< 0.4 | 3.2< 6.4 | %
RX Level | 6 | 23 | ----
-105<-104 | -88< -87 | dBm
Class Ib(13200 Bits) Class II(7800 Bits)
BER Bits(22800 Bits)

Figure 5-77 [Configuration: Test Condition] (GPRS Mode) Screen


Configuration : Test Condition
2005/12/23 15:36
Print Screen
Return
Radio System: GSM900
GSM Mode: GPRS
Network
MCC: 001
MNC: 01
NCC: 1
LAC: 1
BS_PA_MFRMS: 2
MS Power Class: 4
PWR CNTL
MANUAL TEST: 5: +33 dBm
Averaging: Off
Data: PN15
BS Level: -50.0 dBm
Sens BS Level: -85.0 dBm
BLER Frames: 10
BER Frames: 10 (1600 Bits)
SignalingPattern: 1
LocUpdate (Attach) Delay: 0 sec
Coding Scheme: 1
Test Mode: ACK
Test Item | LO Limit | HI Limit | Unit
Peak TX Power
PWR CNTL 5 | -3.0 | +3.0 | dB
Burst Timing | -3.0 | +3.0 | Bits
Power Ramp | Template | Template | ----
Phase Error(RMS) | ----- | +5.0 | deg
Phase Error(Peak) | -20.0 | +20.0 | deg
Frequency Error | -90 | +90 | Hz
Sensitivity
BLER | ----- | 10.00 | %
BER | ----- | 0.12 | %

Softkey Menu Field

Softkey Menu

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **Return**: Returns to the [Configuration] screen.

NOTE Install the Option G03 before using EGPRS function.

Screen Fields

Set the input fields of the parameters for Automatic Test, Manual Test, and TX Analyzer according to the description of Table 5-78.

Table 5-78 [Configuration: Test Sequence] Screen Input Field

Input Field	Description
Radio System	Selects the radio system from GSM850, GSM900, DCS1800 and PCS1900. This setting is for Manual Test, TX Analyzer, and Signal Generator.
GSM Mode	Selects GSM or GPRS. This setting is for Manual Test.
Network	Sets the network parameters. Setting these parameters is required when you test a mobile phone using a user SIM instead of a test SIM or when you want to test network capability. • MCC: Sets Mobile Country Code. The allowable range is from 000 to 999. Set 001 for using Test SIM supplied by Agilent Technologies. • MNC: Sets Mobile Network Code. The allowable range is from 00 to 99. Set 01 for using Test SIM supplied by Agilent Technologies. • NCC: Sets Network Color Code. The allowable range is from 0 to 7. • LAC: Sets Location Area Code. The allowable range is from 0 to 65535. • BS_PA_MFRAMS: Sets the number of multiframes between two transmissions of the same paging message (BS_PA_MFRMS). The allowable range is from 2 to 9. This setting is for Automatic Test and Manual Test.
MS Power Class	Sets MS power class. The allowable ranges are as follows: • GSM850: 2 to 5 • GSM900: 2 to 5 • DCS1800: 1 to 3 • PCS1900: 1 to 3 This setting is for Automatic Test, Manual Test, and TX Analyzer.
PWR CNTL * (High †, Mid, Low, Manual Test)	For the Automatic Test mode, sets three power control levels for the High, Mid and Low levels. For the Manual Test mode and TX Analyzer mode, set one power control level. The allowable ranges for each radio system are as follows: GSM850: 2 to 19 (+39dBm to +5dBm) GSM900: 2 to 19 (+39dBm to +5dBm) DCS1800: 29 to 15 (+36dBm to 0dBm) PCS1900: 30 to 15 (+33dBm to 0dBm) The maximum value is limited by the **MS Power Class** setting.
Averaging ‡	Averages respective measurement values of Peak TX Power, Phase Error and Frequency Error. Sets the averaging number from 2 to 99 or Off. When this function is not required, select Off. This setting is for Automatic Test, Manual Test, and TX Analyzer. Also, this setting can be done on the [Manual Test] and the [TX Analyzer] screens.
Data	Sets transmit data to PN9, PN9Fix or PN15. This setting is for Automatic Test and Manual Test.

Table 5-78 [Configuration: Test Sequence] Screen Input Field

Input Field	Description
BS Level ‡	Sets the RF output level of the Tester except for the Sensitivity test. The allowable range is from `-110.0` to `-50.0` dBm in `0.1` dB steps. This setting is for Automatic Test, Manual Test and Signal Generator.
BER BS Level ‡ (GSM mode)	Sets the RF output level of the Tester for the Sensitivity test. The allowable range is from `-110.0` to `-50.0` dBm in `0.1` dB steps. This setting is for Automatic Test and Manual Test (GSM mode).
BLER BS Level ‡ (GPRS/EPGRS mode)	Sets the RF output level of the Tester for the Sensitivity test. The allowable range is from `-110.0` to `-50.0` dBm in `0.1` dB steps. This setting is for Manual Test (GPRS/EGPRS mode).
BER Frames ‡ (GSM mode)	Sets the number of test frames. The allowable range is from `1` to `13000`. The number of test bits, derived from the equation **Test Frames multiplied by 78 bits**, is displayed in the parentheses. This setting is for Automatic Test and Manual Test (GSM mode).
Fast BER Frames ‡ (GSM mode)	Sets the number of test frames. The allowable range is from `1` to `13000`. The number of test bits, derived from the equation **Test Frames multiplied by 456 bits**, is displayed in the parentheses. This setting is for Manual Test (GSM mode).
BLER Frames ‡ (GPRS/EPGRS mode)	Sets the number of test frames. The allowable range is from `1` to `13000`. The number of test bits, derived from the equation **Test Frames multiplied by 78 bits**, is displayed in the parentheses. This setting is for Manual Test (GPRS/EPGRS mode).
BER Frames ‡ (GPRS mode)	Sets the number of test frames for Test Mode B BER. The allowable range is from 1 to 13000. The number of test bits, derived from the following equation is displayed in the parentheses.

Coding Scheme	Equation
CS1	BER Frames x 160 bits
CS2	BER Frames x 240 bits
CS3	BER Frames x 288 bits
CS4	BER Frames x 400 bits

Loopback Delay (GSM Mode)	Selects voice loop-back delay from `Short`, `Mid` and `Long`. This setting is for Automatic Test and Manual Test.
Signaling Pattern ‡	Sets a signaling pattern. The allowable range is from `1` to `255`. Select `1` at present because settings over `2` will be extended in future.
Connection Wait (GSM mode)	Sets the connection wait time for MS CALL. The allowable range is from `0` to `9` sec in `1` sec step. This setting is for Manual Test (GSM mode).
LocUpdate (Attach) Delay ‡ (GSM/GPRS/EGPRS mode)	Sets the delay time after **Location Update** or **Attach**. The allowable range is from `0` to `9` sec in `1` sec step. This setting is for Manual and Automatic Test.

Table 5-78 [Configuration: Test Sequence] Screen Input Field

Input Field	Description
Test Loop (GSM mode)	Selects Test Loop of **A** or **C**. This setting is for Manual Test (GSM mode).
Coding Scheme ‡ (GSM/GPRS/EGPRS mode)	Sets the Coding Scheme of PDTCH data (up and down). Selects from CS1 to CS4 and MCS1 to MCS9. This setting is for Manual Test (GPRS/EGPRS mode).
Test Mode (GPRS/EGPRS mode)	Selects from ACK, A, B, or SRB. ACK: Measurement of Peak TX Power, Phase Error, Frequency Error, and BLER A: Measurement of Peak TX Power, Phase Error, and Frequency Error and EVM B: Measurement of Peak TX Power, Phase Error, Frequency Error, and EVM. Active in Unacknowledged Mode for UL/DL. SRB: Measurement of Peak TX Power, Phase Error, Frequency Error, and EVM. Active in Unacknowledged Mode for UL/DL. This setting is for Manual Test (GPRS/EGPRS mode).
Puncturing Scheme (EGPRS mode)	Sets the Puncturing Scheme of PDTCH data (down). Selects from `P1` to `P3`. P3 is selected only for MCS3, MCS4, MCS7, MCS8 and MCS9. This setting is for Manual Test (GPRS/EGPRS mode).
Inc Redund (EGPRS mode)	Sets `On` or `Off` of the Incremental Redundancy of re-forwarding PDTCH during Test Mode: Ack test.

* Set the **MS Power Class** to the power class of the mobile phone under the test. If the mobile phone does not support the **PWR CNTL**, measurement result is not displayed.

† In the Automatic Test mode, the High value is used for the Burst Timing, Power Ramp, Phase Error and Frequency Error measurements.

‡ The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

Setting Measurement Limits for Measurement Items

The LO Limit and HI Limit values for the measurement items in the table need to be set to execute Pass/Fail tests by Automatic Test, Manual Test, and TX Analyzer. All measurement items can be set with limits to execute Pass/Fail tests on the [Configuration: Test Sequence] screen (even if some measurement items are skipped).

The changing magnification softkey is available. Refer to Storing Numeric Values on page 8 and Changing Magnification Softkey on page 13.

Table 5-79 Configuration: Test Condition Measurement Item

Measurement Item	Description
Peak TX Power	Sets a high and a low measurement limit. The nominal limits are specified depending on the radio system and the power control level (**PWR CNTL**). You can change the nominal limits by entering temporary limits ranging from `-99.9` to `+99.9` dB in `0.1` steps. However, once power control level is changed after this modification, the nominal limits are automatically set.
Burst Timing	Sets a high and a low measurement limit. The allowable range is from `-9.9` to `+9.9` bits in `0.1` steps.
Power Ramp	The test limits are automatically specified depending on the radio system selected.
Phase Error (RMS)	Sets a high measurement limit for the rms over the active part of the timeslots between `0` and `147` bits. The allowable range is from `+0.0` to `+99.9` in `0.1`° steps.
Phase Error (Peak)	Accepts a set of a high and a low measurement limit for the peak errors over the active part of the timeslots between `0` and `147` bits. The allowable range is from `-99.9` to `+99.9` in `0.1`° steps.
Frequency Error	Sets a high and a low measurement limit over the active part of the timeslots. The allowable range is from `-99999` to `+99999` Hz in `1` Hz step.
Sensitivity/BER Class Ib, Class II (GSM mode)	Sets a high measurement limit. The allowable range is from `0.00` to `99.99` % in `0.01` % steps.
Sensitivity/FER (GSM mode)	Sets a high measurement limit. The allowable range is from `0.00` to `99.99` % in `0.01` % steps.
RX Quality (GSM mode)	Sets a high and a low measurement limit. The allowable range is `0` to `7`.
RX Level (GSM mode)	Sets a high and a low measurement limit. The allowable range is `0` to `63`.
Sensitivity/BLER (GPRS/EGPRS mode)	Sets a high measurement limit. The allowable range is from `0.00` to `99.99` % in `0.01` % steps.
Sensitivity/BER (GPRS mode)	Sets a high measurement limit. The allowable range is from `0.00` to `99.99` % in `0.01` % steps.
EVM RMS	Sets a high measurement limit. The allowable range is from `0.00` to `99.99` % in `0.01` % steps.
EVM Peak	Sets a high measurement limit. The allowable range is from `0.00` to `99.99` % in `0.01` % steps.
EVM 95%	Sets a high measurement limit. The allowable range is from `0.00` to `99.99` % in `0.01` % steps.
Origin Offset Spr. (EGPRS mode)	Sets a high measurement limit. The allowable range is from `0.00` to `99.99` % in `0.01` % steps.
ORFS Mod	Sets a high measurement limit. The allowable range is from `-99.9` to `0.0` dBm in `0.1` dB steps.

Table 5-79 Configuration: Test Condition Measurement Item

Measurement Item	Description
ORFS SW	Sets a high measurement limit. The allowable range is from `-99.9` to `0.0` dBm in `0.1` dB steps.

Configuration: File Management

When the **File Management** softkey is pressed on the [Configuration] screen, the screen as Figure 5-78 is displayed. All parameter files are listed in the table.

You can save/recall a parameter file to/from the following two devices:

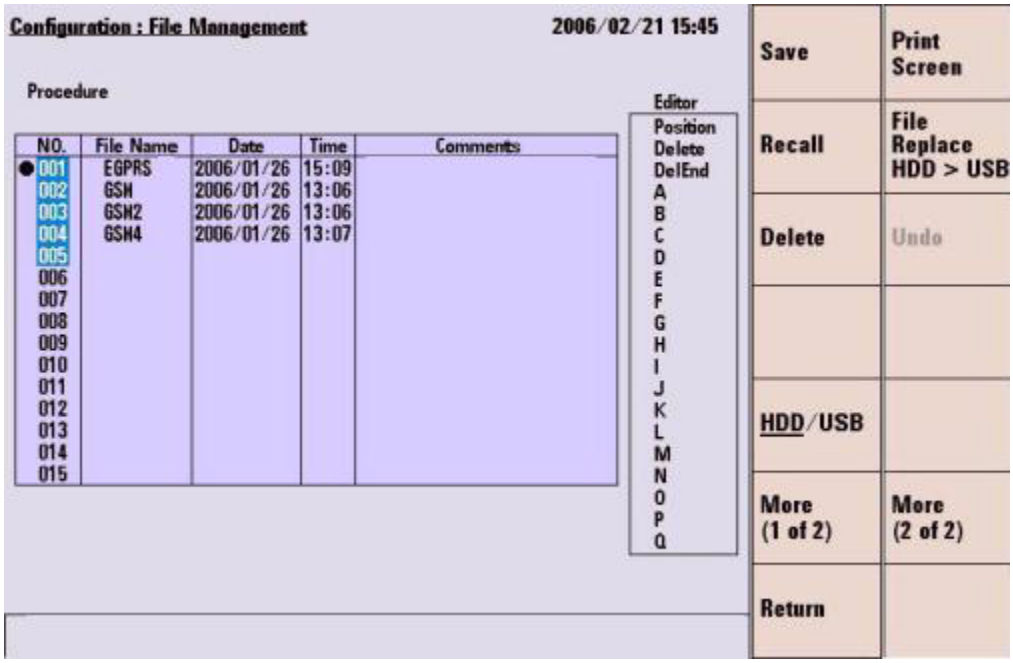
- A USB memory device
- HDD in the Tester

Select the device you want to use by pressing the **HDD/USB** softkey.

NOTE

If you use a USB memory device, insert a proper USB memory device into the USB Connector on the front panel of the Tester.

Figure 5-78 [Configuration: File Management] Screen



Softkey Menu Field

Softkey Menu 1

- **Save**: Saves a file including all test parameters which are currently set into the HDD or a USB memory device. Refer to Saving a Test Setup File on page 184.
- **Recall**: Recall one of the test parameter files from the HDD or a USB memory device into the Tester. Refer to Saving a Test Setup File on page 184.
- **Delete**: Deletes the test parameter file selected by the CURSOR CONTROL knob. Refer to Deleting a Test Setup File on page 193.
- **HDD/USB**: Selects the HDD in the Tester or a USB memory device.
- **More (1 of 2)**: Displays the softkey menu 2.
- **Return**: Returns to the [Configuration] screen.

Softkey Menu 2

- **Print Screen**: Prints a hardcopy of the screen or saves a graphic file of the screen in a USB memory device depending on the setting of the **Printer** input field on the [Configuration] screen.
- **File Replace HDD <- USB**: Copies the Test Setup files of HDD to the USB memory device.
- **File Replace HDD - > USB**: Copies the Test Setup files of the USB memory device to HDD.
- **Undo**: Cancels the above file replacement operation and returns to the original state.
- **More (2 of 2)**: Returns to the softkey menu 1.

Saving a Test Setup File

Save a new parameter file with the following procedure:

Step 1

If you save a file including all parameters that are currently set in a USB memory device, go to Step 2. Or, go to Step 3 to save a file to the HDD.

Step 2

Insert a USB memory device into the USB Connector on the front panel of the Tester.

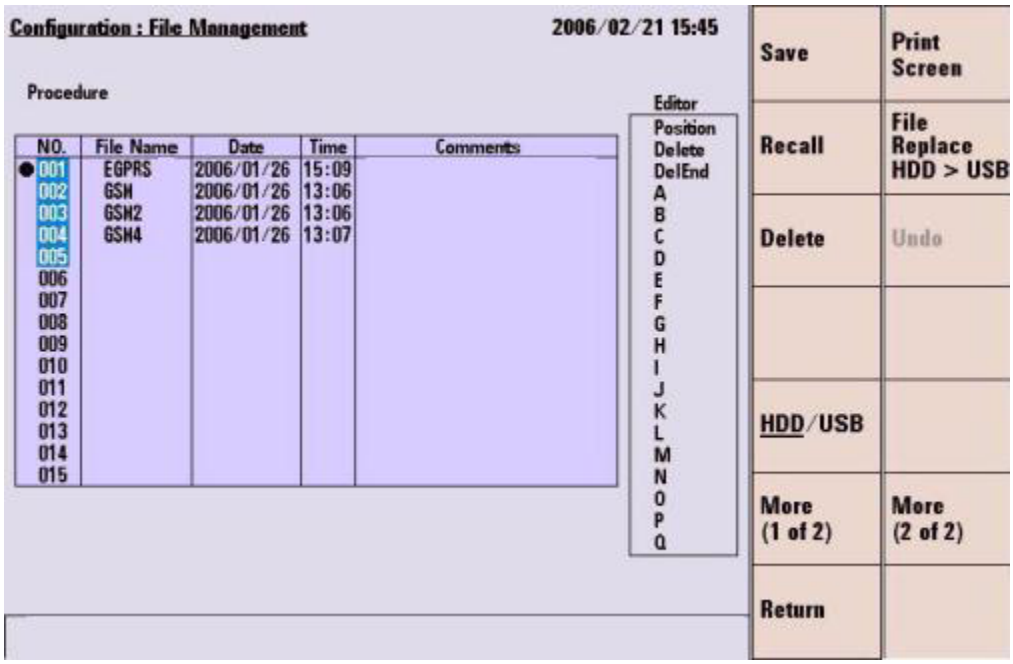
Step 3

Select a device you want to use to save a parameter file by toggling the **HDD/USB** softkey. The selected device, either `HDD` or `USB`, is underlined.

Step 4

Move the cursor to the file number to which you want to save a new test parameter file.

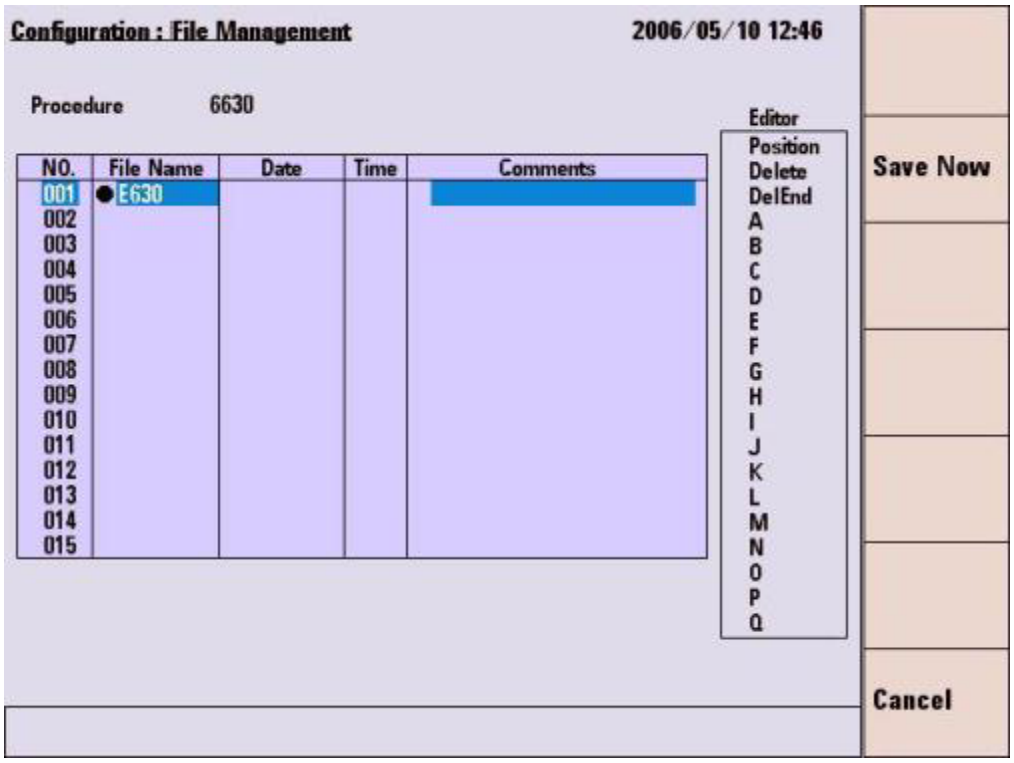
Figure 5-79 [Configuration: File Management] Save-1 Screen



Step 5

Press the **Save** softkey. The **Filename** and **Comment** fields are highlighted, and the cursor is placed at the **Filename** field. At this time, a default file name is automatically displayed in the **Filename** field. If you want to change the file name, go to Step 6. If you do not change the file name, go to Step 9.

Figure 5-80 [Configuration: File Management] Save-2 Screen



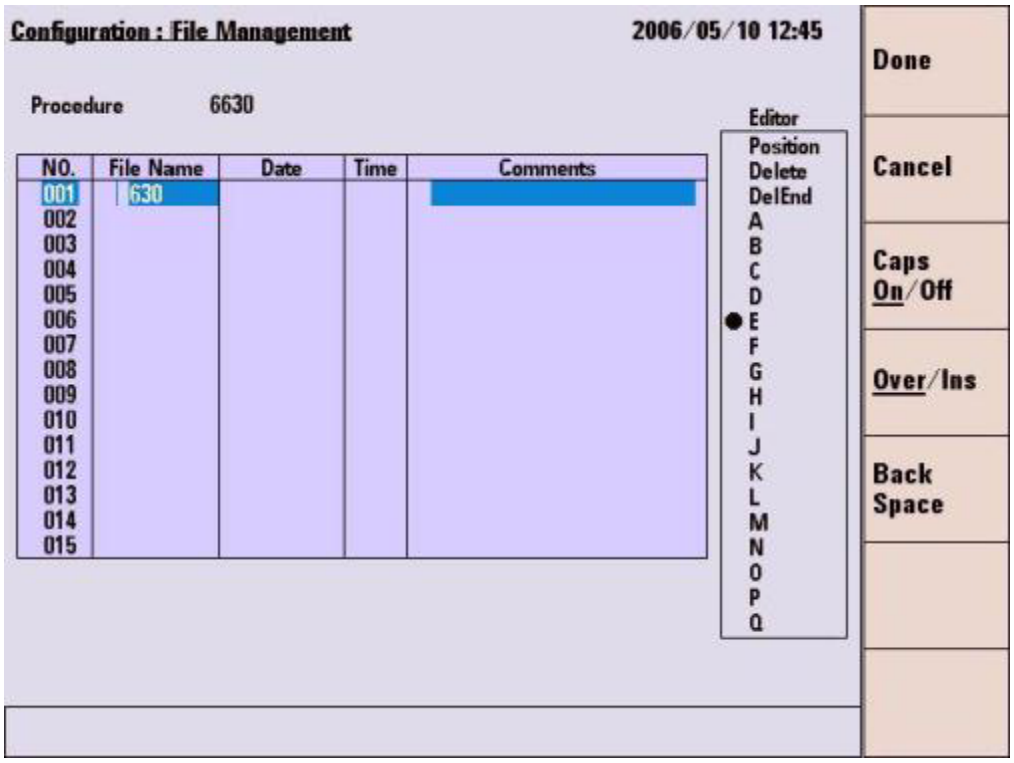
Softkey Menu

- **Save Now**: Saves the parameter file in the HDD or USB memory device. Press this softkey after entering a filename and comment.
- **Cancel**: Cancels saving and returns to the screen in Step 4.

Step 6

Press the CURSOR CONTROL knob once to activate the **Editor** scrolling field. The rectangular cursor is placed at the first position of the **Filename** field enabling you to enter the first character of the filename.

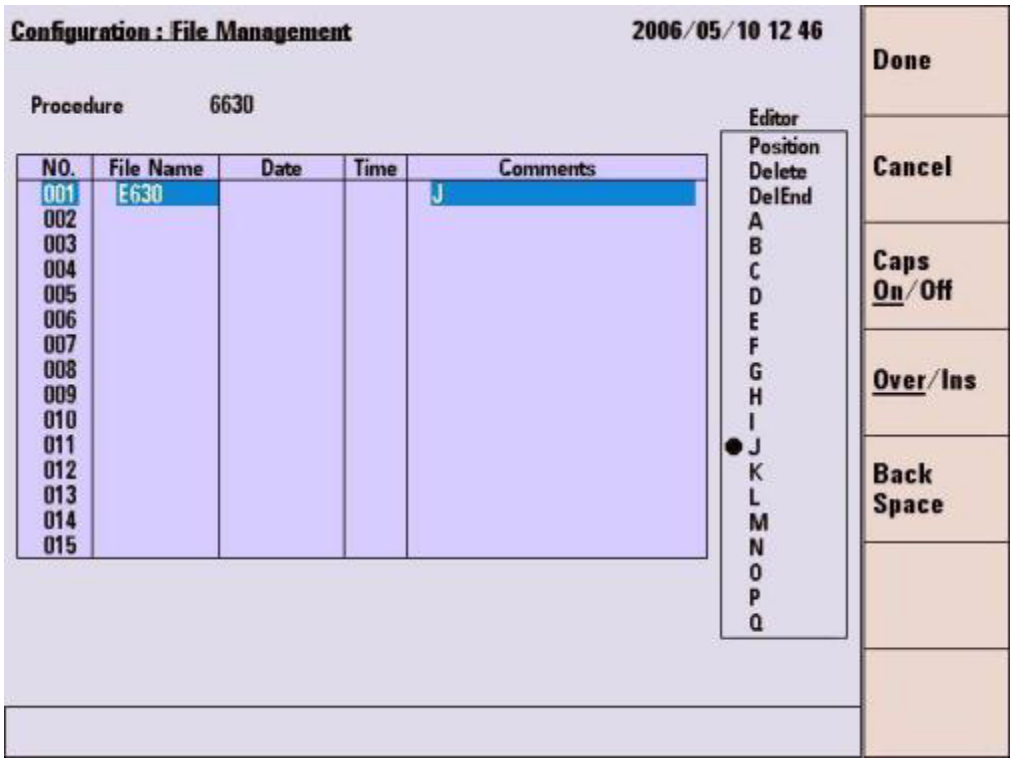
Figure 5-81 [Configuration: File Management] Save-3 Screen



Step 7

Selects alphanumeric characters and other symbols by rotating and pressing the CURSOR CONTROL knob to edit a filename.

Figure 5-82 [Configuration: File Management] Save-4 Screen



Softkey Menu

- **Done**: Determines the words entered.
- **Cancel**: Cancels editing.
- **Caps On/Off**: Selects upper case or lower case of characters.
  - `On`: Selects upper case character
  - `Off`: Selects lower case character
  - `Over/Ins`: Selects `Over` (overwrite) or `Ins` (insert).
  - `Over`: Overwrite (erase and replace) characters selected.
  - `Ins`: Insert characters at the position of the rectangular cursor without erasing the existing characters.
- **Back Space**: Erases a character at the left side of the rectangular cursor.

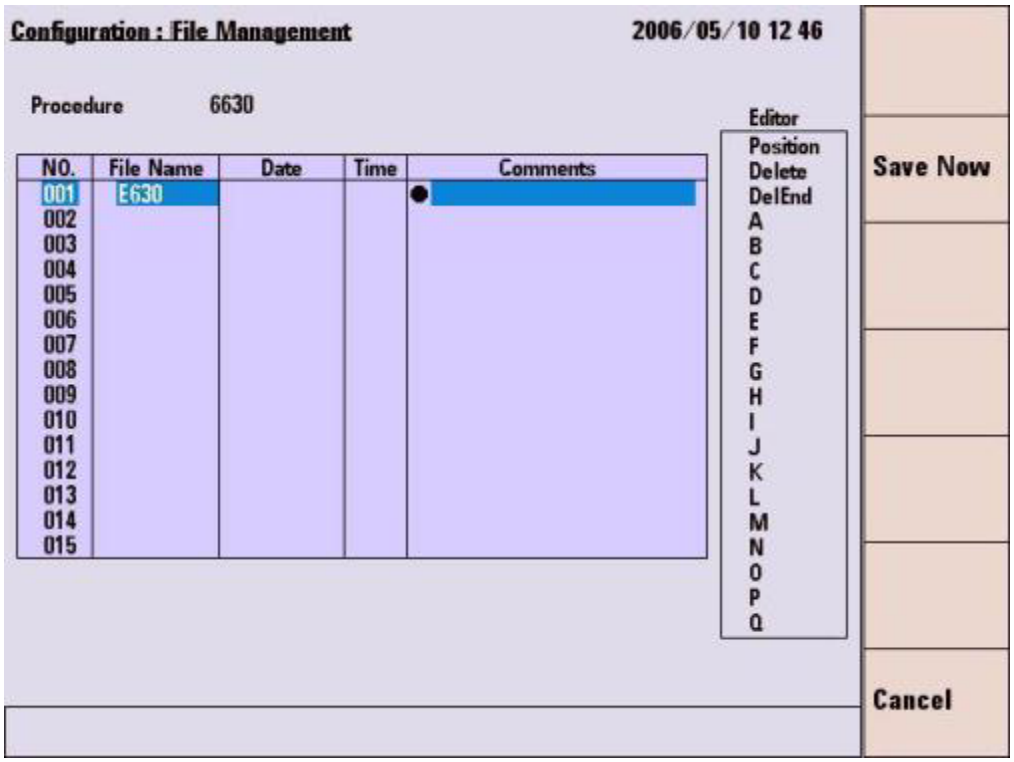
Step 8

Press the **Done** softkey to enter the filename edited.

Step 9

Move the cursor to the **Comment** field and press it once. The rectangular cursor is placed at the first position of the **Comment** field enabling you to enter the first character of a comment. Create a comment with similar operation to that for editing a file name. Refer to Step 7 and Step 8 to complete creating a comment.

Figure 5-83 [Configuration: File management] Save-5 Screen



Softkey Menu

- **Save Now**: Executes saving.
- **Cancel**: Cancels entering and returns to the screen in Step 5.

Step 10

After entering the new file name and comment, press the **Save Now** softkey to execute saving.

Step 11

If saving is properly done, the new filename should be displayed in the filename table with the Date and Time data that are automatically taken from the internal clock of the Tester.

NOTE

Remove the USB memory device after returning to the [Configuration] screen by pressing the **Return** softkey.

The USB memory device should not be removed while the [File Management] screen is displayed. Otherwise, the parameter files may be damaged.

Recalling a Test Setup File

Recall one of the parameter files with the following procedure:

Step 1

If you recall a file containing test parameters from a USB memory device, go to Step 2. Or, go to Step 3 to recall a file from the HDD.

Step 2

Insert a USB memory device into the USB Connector to obtain the parameter file list.

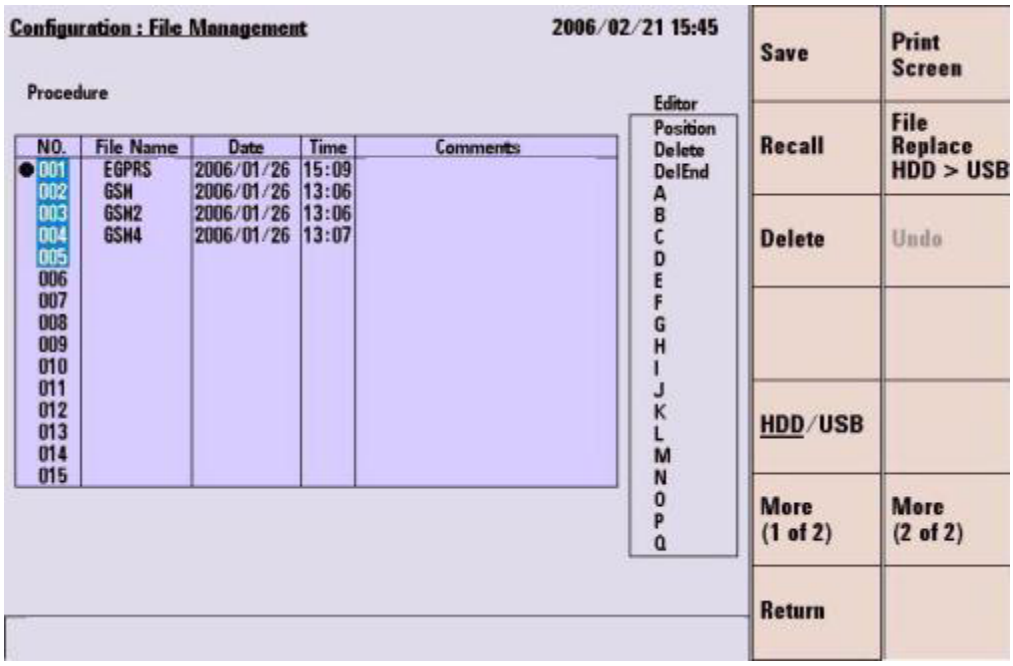
Step 3

Select a device you use to recall a test parameter file by pressing the **HDD/USB** softkey. The selected device, either `HDD` or `USB`, is underlined.

Step 4

Move the cursor to the file number to which you want to recall the test parameter file.

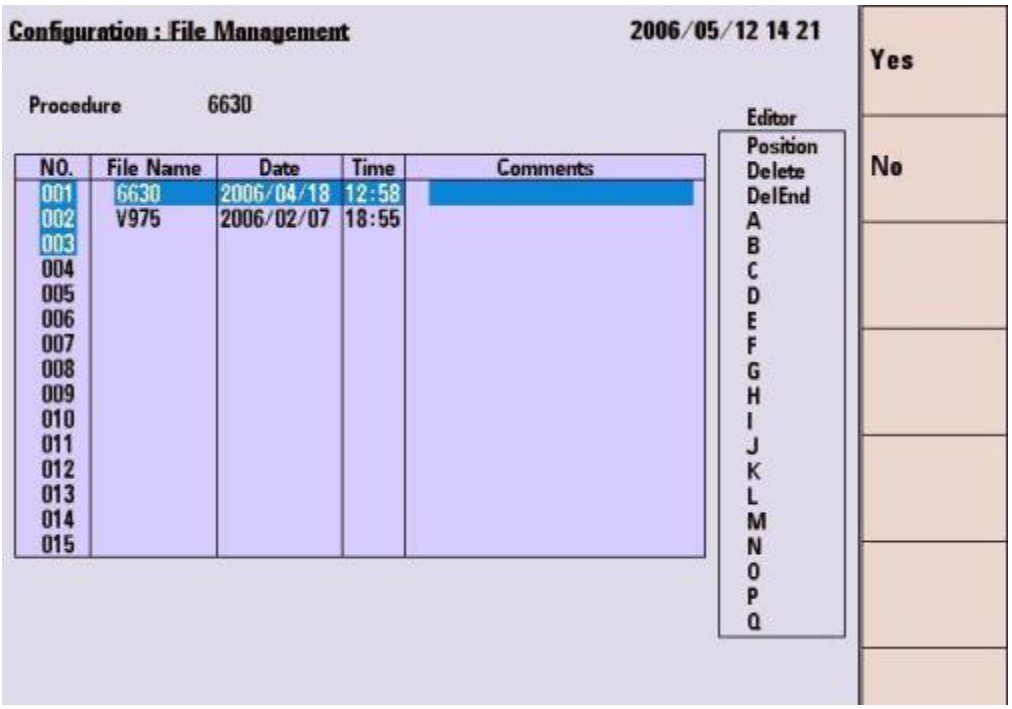
Figure 5-84 [Configuration: File Management] Recall-1 Screen



Step 5

Press the **Recall** softkey, and then the **Filename**, **Date**, **Time** and **Comment** fields are highlighted.

Figure 5-85 [Configuration: File Management] Recall-2 Screen



Softkey

- **Yes**: Executes restoring the parameter file.
- **No**: Cancels recalling the parameter file and returns to Step 4.

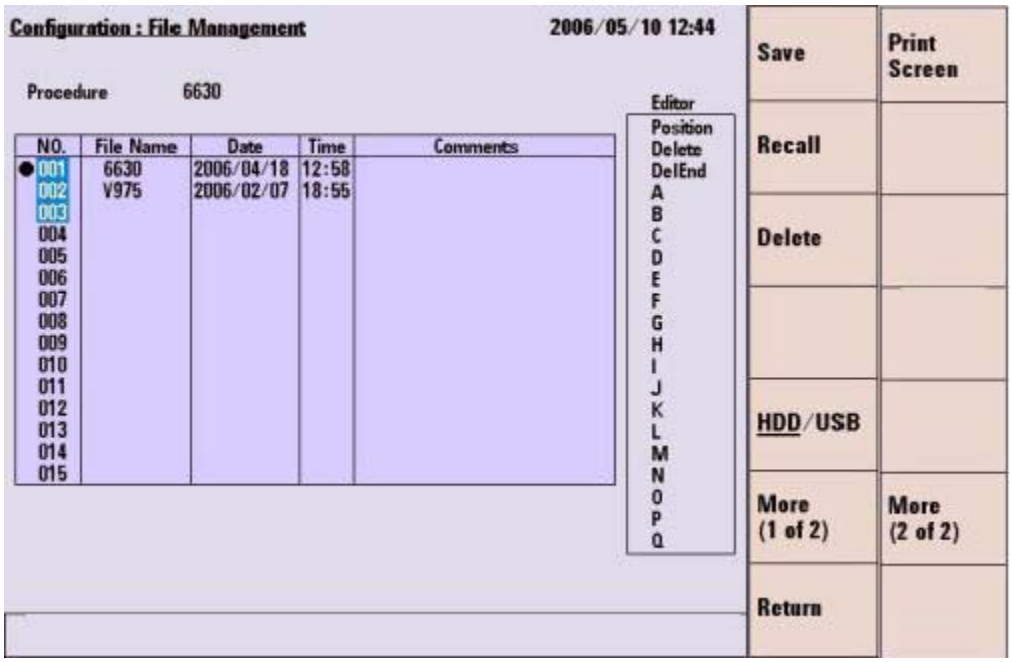
Step 6

Respond to the operation message **Ok to recall?** in the message field by pressing the **Yes** softkey. If there is something to revise, press the **No** softkey to go back to Step 4.

Step 7

If the file is correctly recalled to the Tester, the **Procedure:** field above the table shows the filename. The cursor is placed next to the file number. The softkey menu returns to the initial menu.

Figure 5-86 [Configuration: File Management] Recall-3 Screen



Deleting a Test Setup File

Delete one of the parameter files with the following procedure:

Step 1

If you delete a file containing test parameters from a USB memory device, go to Step 2. Or, go to Step 3 to delete a file from the HDD.

Step 2

Insert a USB memory device into the USB Connector to obtain the parameter file list.

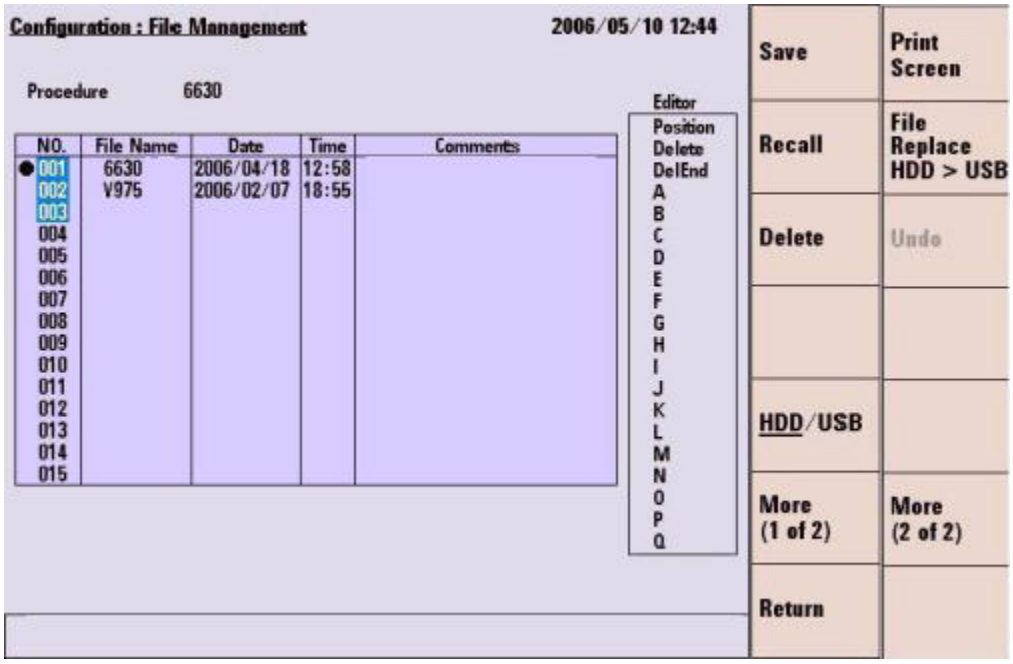
Step 3

Select a device which you want to delete the test parameter file by pressing the **HDD/USB** softkey. The selected device, either `HDD` or `USB`, is underlined.

Step 4

Move the cursor to the file number of which you want to delete the test parameter file.

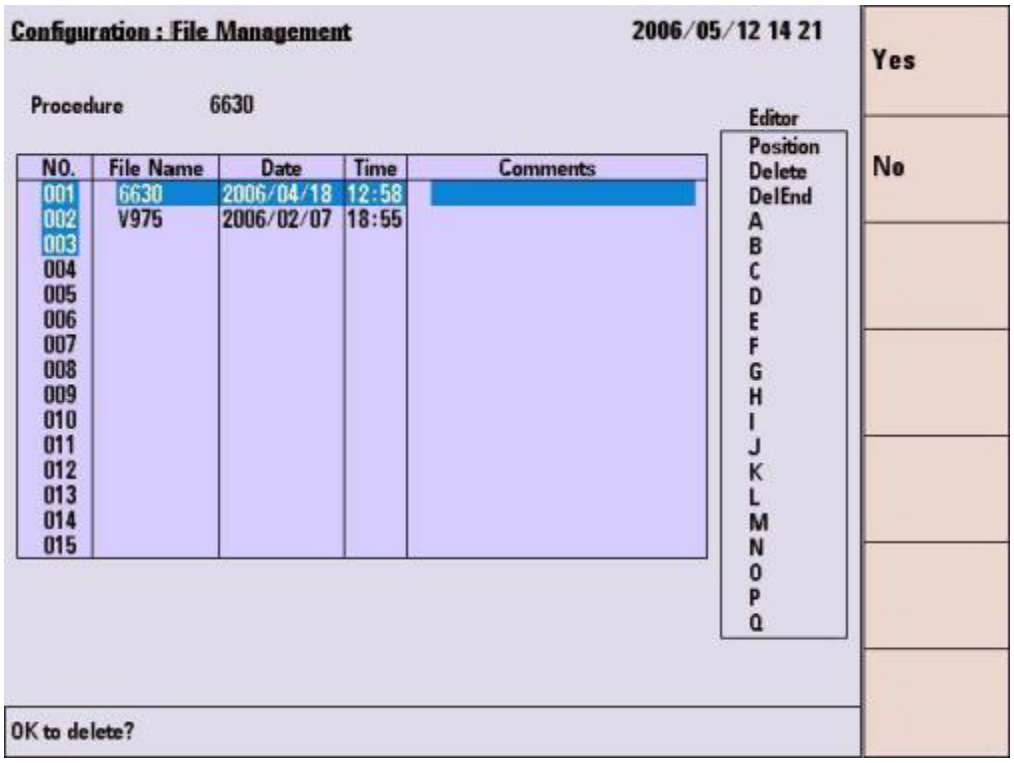
Figure 5-87 [Configuration: File Management] Delete-1 Screen



Step 5

Press the **Delete** softkey, and then the **Filename**, **Date**, **Time** and **Comment** fields are highlighted.

Figure 5-88 [Configuration: File Management] Delete-2 Screen



Softkey

- **Yes**:Executes deleting the parameter file.
- **No**:Cancels deleting the parameter file and returns to Step 4.

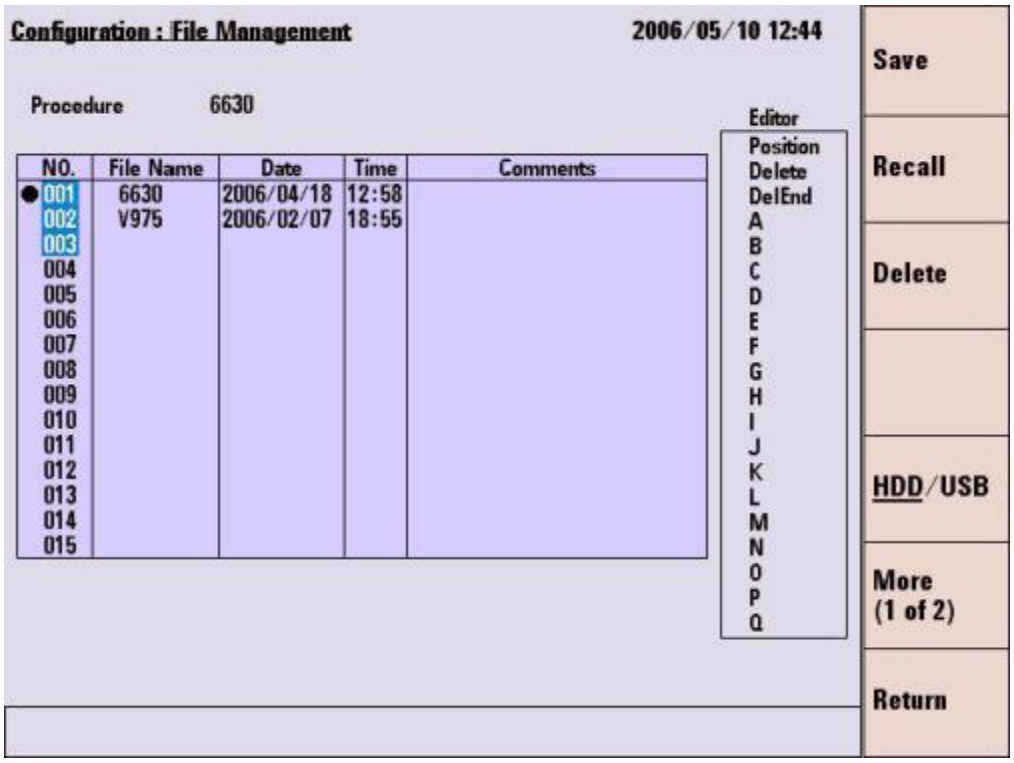
Step 6

Respond to the operation message **Ok to delete?** in the message field by pressing the **Yes** softkey. Or, press the **No** softkey to go back to Step 4.

Step 7

When deleting is properly done, the file disappears and the softkey menu returns to the initial menu.

Figure 5-89 [Configuration: File Management] Delete-3 Screen



Replacing a Test Setup File

Replace the parameter files in the HDD with the data in the USB memory device or vice versa. All the parameter files saved in the original device are replaced.

NOTE

After executing the **File Replace** operation, the whole data is replaced to the new one and original parameter files may be deleted even if the file names are different.

Step 1

Insert USB memory device into the USB connector on the front panel of the Tester.

Step 2

Press the **HDD/USB** softkey and select the device where the source data is saved.

- HDD is underlined: The data saved in the HDD is copied to the USB.
- USB is underlined: The data saved in the USB is copied to the HDD.

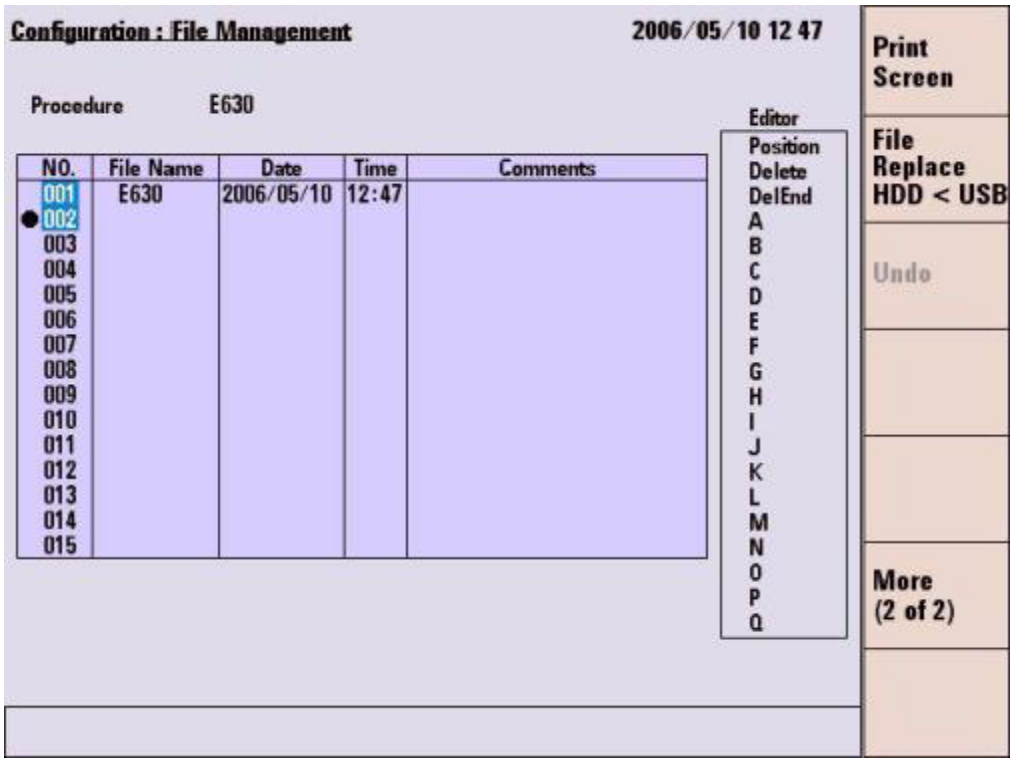
Step 3

When the Softkey Menu 1 is displayed, press **More (1 of 2)** to display Softkey Menu 2.

Step 4

Press **File Replace** softkey.

Figure 5-90 [Configuration: File Management] Replace-1 Screen



Step 5

When the data is copied from hard disk to USB memory device, Figure 5-91 is shown. when the data is copied from USB memory device to hard disk, Figure 5-92 is shown.

Figure 5-91 [Configuration: File Management] Replace-2 Screen

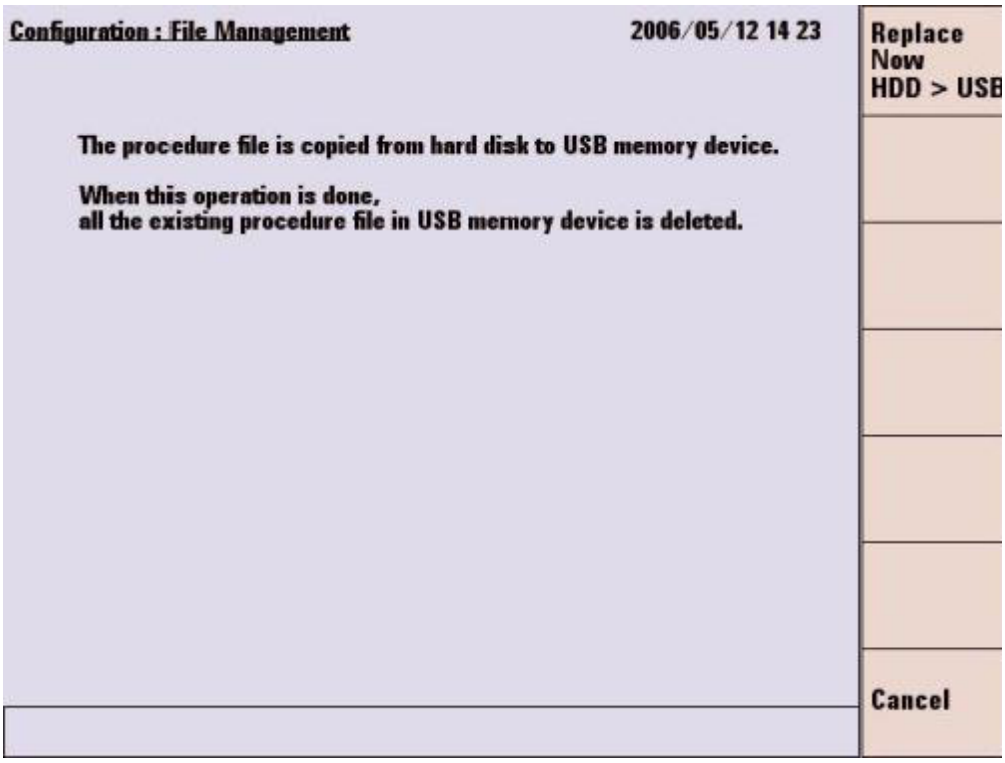
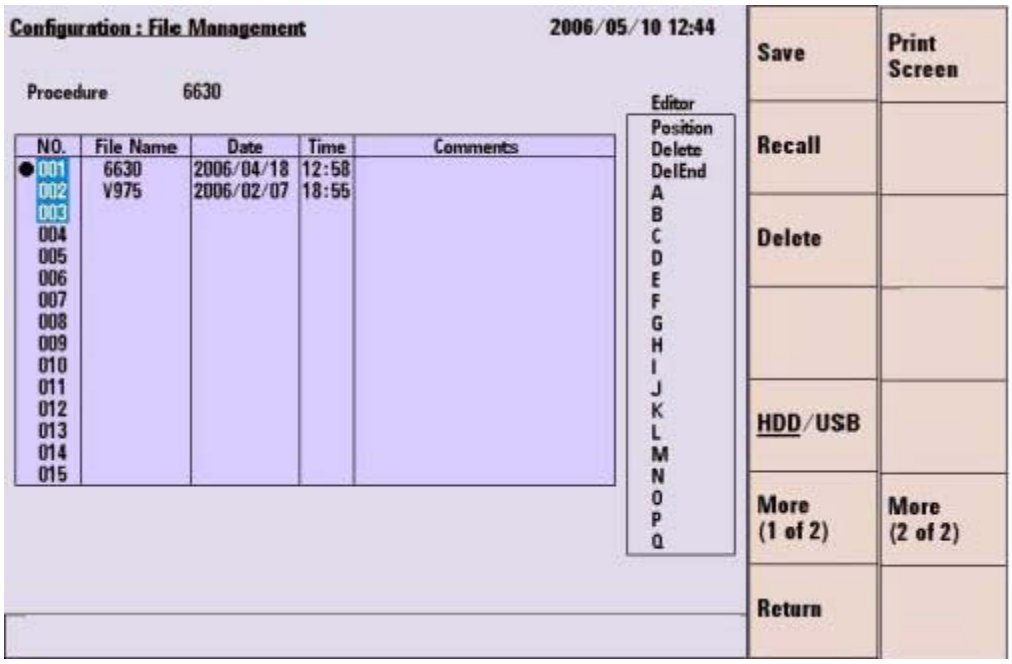

Configuration : File Management
2006/05/12 14 23
The procedure file is copied from hard disk to USB memory device.
When this operation is done,
all the existing procedure file in USB memory device is deleted.
Replace Now
HDD > USB
Cancel

Figure 5-92 [Configuration: File Management] Replace-3 Screen



Softkey Menu

- **Replace Now**: Starts **Replace** operation.
- **Cancel**: Cancels replacing and returns the screen in Step 4.

Step 6

Confirm the source and destination, and press **Replace Now** softkey.

Step 7

When the operation is completed, the screen of the Figure 5-90 is displayed.

THIS PAGE IS INTENTIONALLY LEFT BLANK

6
Troubleshooting

Item to be checked 6-2
Error Information 6-6

This chapter describes how to solve problems and explains about error information that will be displayed on the screen.

Item to be checked

The symptoms listed below may not be caused by Tester failure.

Check the following items before requesting repair. Also, Refer to the *N9360A Multi UE Tester Installation Guide*.

Table 6-1 Item to be checked

Symptom	Section to be checked	Remedy
The Tester is not activated. A message **ERROR!! 0000 1002 Unit initialization failure.** is displayed on screen.	Is the external reference signal connected correctly?	When the **Reference** on the [Configuration] screen is set to `External`, the Tester is not activated unless 10 MHz reference signal is inputted to the Reference IN connector on the rear panel. Connect 10 MHz reference signal to the Reference IN connector and then reboot the Tester.
The Test SIM card cannot be read by the mobile phone.	Is the Test SIM card set to the mobile phone correctly?	Set the Test SIM card to the mobile phone correctly. When the card is damaged and additional purchase is required, contact the Agilent Sales Department or an authorized distributor to place a purchase order for another Test SIM.
Location update fails.	Is the Test SIM card set to the mobile phone correctly?	Set the Test SIM card to the mobile phone correctly. When the card is damaged and additional purchase is required, contact the Agilent Sales Department or an authorized distributor to place a purchase order for another Test SIM.
	Is there an influence from the external noise?	Shut out external noise by using the shield case, etc.
	Is path loss set correctly?	Set path loss between the Tester and the mobile phone at **Loss** on the [Configuration] screen.
Call is disconnected at the measurement of Sensitivity BER	Is the BS level weak?	Raise the BS level.
	Is there interference from the external noise?	Shut out external noise by using the shield case, etc.
	Is path loss set correctly?	Set path loss between the Tester and a mobile phone at **Loss** on the [Configuration] screen.

Table 6-1 Item to be checked

Symptom	Section to be checked	Remedy
—— is displayed at the measurement of Sensitivity BER.	Is the BER BS level or the Sens BS level weak? (The above values may differ according to the Radio System.)	Raise the BER BS level or the Sens BS level.
		Set the lower BER Frame.
	Is the PWR CTRL low?	Set the higher PWR CTRL.
	Is path loss set correctly?	Set path loss between the Tester and a mobile phone at **Loss** on the [Configuration] screen
	Does the slot configuration conform to the multislot class of the mobile phone?	Set the slot configuration which conforms to the multi-slot class of the mobile phone.
	Does this symptom still occur in spite of above three remedies?	If a UL RLC/MAC payload happens to contain the Length indicator fields during the GPRS BER measurement, GPRS BER can not be measured precisely. (for the future, the above problem is to be solved.)
		The phases of the PN data except PN9fix are supposed to be continuous during the measurement. If the phases become discontinuous halfway, Sensitivity BER can not be measured precisely.
EGPRS BLER does not result in 0,00%.	Is the BS level weak?	Raise the BS level.
	Is there interference from the external noise?	Shut out external noise by using the shield case, etc.
	Is path loss set correctly?	Set path loss between the Tester and a mobile phone at **Loss** on the [Configuration] screen
	Does this symptom still occur in spite of above three remedies?	The DL EVM of the Tester which is below 12,5% may have a negative influence on EGPRS BLER.
Radio performance tests tend to fail.	Is there interference from the external noise?	Shut out external noise by using the shield case, etc.
	Is path loss set correctly?	Set path loss between the Tester and a mobile phone at **Loss** on the [Configuration] screen.
	Is TCH for handover set adjacent to BCCH?	When handing over to TCH is adjacent to BCCH, handover can fail. Set the frequency of TCH away from that of BCCH.
Handover fails.	Does the mobile phone require Detach process?	Some kinds of GPRS mobile phones are confirmed that they require Detach from Attached condition. In this case, the Tester cancels Attached condition. Retest from Location Update.

Table 6-1 Item to be checked

Symptom	Section to be checked	Remedy
Attach process fails in GPRS mode.	Does the mobile phone require Detach process?	Some kinds of GPRS mobile phones are confirmed that they require Detach from Attached condition. In this case, the Tester cancels Attached condition. Retest from Location Update.
—— is displayed at the measurement results.	Is the mobile phone connected to the Tester correctly?	Make sure that the mobile phone is connected to the Tester,and start the test.
	Is there interference from the external noise?	Shut out external noise by using the shield case, etc.
	Is the format of the signal inputted to the Tester the same as the setting value of the Tester?	Set the **Signal** on the [TX Analyzer] screen according to the actual signal format,and start the test.
	Is the slot configuration set correctly?	Set the **Slot Config** on the [Manual Test] screen according to the multislot class of the mobile phone, and start the test.
	Is the Test loop or the Test Mode set correctly?	Set the **Test Loop** or **Test Mode** on the [Manual Test] screen according to the Test mode capability of the mobile phone, and start the test.
	Is error information displayed on the Graph/Value screen?	Execute the action according to each error information, and start the test.
The MS power level is too low or too high. Check PWR CNTL, the cable Connections and loss value is displayed on the Graph/Value screen.	Is the mobile phone connected to the Tester correctly?	Make sure that the mobile phone is connected to the Tester,and start the test.
	Is the transmission power of the mobile phone low?	Raise the transmission power of the mobile phone to the level within a measurable range.
	Is there interference from the external noise?	Shut out external noise by using the shield case, etc.
	Is path loss set correctly?	Set path loss between the Tester and a mobile phone at **Loss** on the [Configuration] screen
Burst not found is displayed on the Graph/Value screen.	Is the transmission power of the mobile phone low?	Raise the transmission power of the mobile phone to the level within a measurable range.
	Is the format of the signal inputted to the Tester the burst wave?	Set the **Signal** on the [TX Analyzer] screen to **Burst**,and start the test.

Table 6-1 Item to be checked

Symptom	Section to be checked	Remedy
TSC not found is displayed on the Graph/Value screen.	Does the signal inputted to the Tester contain a training sequence code (TSC)?	Input the signal which contains a TSC to the Tester. If the measurement is carried out with the signal which does not contain any TSC, set the `None` at `Midamble` on the [TX Analyzer] Screen. If `None` is set, Part of test items may not be carried out.
	Is the TSC of the signal inputted to the Tester the same as the setting value of the Tester?	Input the signal which contains the same TSC as the value set at **Midamble** on the [TX Analyzer] Screen, and start the test.
	Is the modulation scheme of the signal inputted to the Tester the same as the setting value of the Tester?	Input the signal whose modulation scheme is the same as the value set at **Demod** on the [TX Analyzer] Screen, and start the test.
	Does this symptom occur on the [Automatic Test] or [Manual Test]?	The mobile phone is sure to be signaled to use TSC5 by the Tester. The mobile phone may use a different TSC from TSC5.
	Does this symptom still occur in spite of above four remedies?	The signal quality of the mobile phone may be bad remarkably.
It exceeds the retrial number of times of the measurement is displayed on the Graph/Value screen.	Is the modulation scheme of the signal inputted to the Tester the same as the setting value of the Tester?	Input the signal whose modulation scheme is the same as the value set at **Demod** on the [TX Analyzer] Screen, and start the test.
TSC out of range is displayed on the Graph/Value screen.	Does the TSC position within the slot over the air deviate from the appropriate TSC position remarkably?	The TSC position within the slot may exceed a allowable range. In case of GMSK, let the TSC position be within ±10symbols. In case of 8PSK, let the TSC position be within ±4symbols.
Tester seems to stop measuring though it has started the measurements.	Is the Averaging of the test items except BER/BLER, the BER Frames (BER) or BLER Frames (BLER) high?	When the Averaging of the test items except BER/BLER, the BER Frames (BER) or BLER Frames (BLER) is high, it takes long time to finish measuring the test items. The screen display of the tester does not change during the measurements. The time for measuring, which is indicated by T_{Mes} [unit: sec], depends on the test items. Refer to Table 6-2. Until this time, the measurements are executed and tester is not out of order.

Table 6-2 The time for measuring

Measurement	T_{Mes} [sec]
TX Power	T_{Mes} = [Ave] + 11
Frequency Error	
Phase Error	
Spectrum Monitor	
EVM	T_{Mes} = [Ave] x 3 + 11
ORFS	T_{Mes} = [Ave] + 10
GSM BER (Test Mode A,C)	T_{Mes} = [FBER] x 0.03 + 4
GPRS BER (Test Mode B)	T_{Mes} = [FBER] x 0.05 + 4
BLER	[F_{BLER}] / [S] x 0.04 + 5
[Ave]: Averaging [FBER]: BER Frames [FBLER]: BLER Frames [S]: Send Slot 1: 1x1 2: 2x1, 2x2 3: 3x1, 3x2 4: 4x1	

Error Information

Error Screen

Figure 6-1 is an example of the screens that are displayed when an error occurs.

Figure 6-1 An Example of [Error] Screens

Error Codes for Error Screens

Table 6-3 and Table 6-4 list error codes for [Error] screens. If the following guidelines do not help you to remove the errors, contact the Agilent Sales Department or an authorized distributor.

Table 6-3 Alarm Notification Error Code

Error Code	Error Content	Action
0000	Abnormal internal temperature	Turn off power and disconnect the AC plug.
0001	The cooling fan stopped.	
0002	Synthesizer unlock (Tx1)	A failure of the internal reference oscillator may have occurred. Turn off power and disconnect the AC code. If you use the external reference signal, check if it is connected correctly.
0003	Synthesizer unlock (Tx2)	
0004	Synthesizer unlock (Tx3)	
0005	Synthesizer unlock (Rx1)	
0006	Synthesizer unlock (Rx2)	
0007	ALC alarm (Tx1)	A hardware error occurred. Reboot the Tester.
0008	ALC alarm (Tx2)	

Table 6-3 Alarm Notification Error Code

Error Code	Error Content	Action
1000	Unit reboot is detected.	A firmware error occurred. Reboot the Tester.
1001	Unit fatal error	
1002	Unit initialization failure	
1005	No indispensable file	
1010	Receiving NAK from RF-CPU	
2000	No MS configuration information	
2002	No scenario	
2003	Scenario read error	
3001	Scenario execution failure because of a hardware error	

Table 6-4 UI Timer Error Code

Error Code	Error Content	Action
5001	Time out for waiting for reception of SC response	A firmware error occurred. Reboot the Tester.
5002	Connecting failure with SC	
5003	Socket disconnection between UI and SC	
5004	SC transmission failure	
5100	UI timer processing error (0: other errors)	
5101	UI timer processing error (1: existence of the timer number)	
5102	UI timer processing error (2: No relevant timer number for stop order)	
5200	UI internal error	
6000	UI firmware update error	
6100	UI procedure file Check Sum Error	

SC the application mounted in the Tester.

7
Performance and Specifications

Measurement Performance 7-2

This chapter lists the performance and specifications of the *N9360A GSM User Manual*.

Refer to the *N9360A Multi UE Tester Installation Guide* about the common specification of the Tester.

Measurement Performance

Peak TX Power

Table 7-1 Peak TX Power

Item		Specification	Unit	Remarks
Input Level Range		–20 to +39	dBm	Burst wave: ≤4 timeslot/frame
Resolution		0.1	dB	
Accuracy	GMSK	≤±1.0 (25°C ±5°C) ≤±1.5 (0°C to 50°C)	dB	
	8-PSK	≤±1.0 (25°C ±5°C) ≤±1.5 (0°C to 50°C)	dB	200 bursts Average

Power Ramp

Table 7-2 Power Ramp

Item		Specification		Unit	Remarks
Input Level Range		–20 to +39		dBm	Burst wave: ≤4 timeslot/frame
Resolution		0.1		dB	
Accuracy	GMSK	≤±1.0 (25°C ±5°C) ≤±1.5 (0°C to 50°C)		dB	
	8-PSK	≤±1.0 (25°C ±5°C) ≤±1.5 (0°C to 50°C)		dB	
Display range	Vertical	80		dB	
	Horizontal	Zoom Off:	-9.25 to +156.25	bits	0.00Bits = 0.00µsec
		Zoom On:	-8.00 to +2.00		
			+145.00 to +155.00		

Frequency Error

Table 7-3 Frequency Error

Item	Specification	Unit	Remarks
Input Level Range	–5 to +39	dBm	Burst wave: ≤ 4 timeslot/frame
Measurement Range	–60 to +60	kHz	
Resolution	1.0	Hz	

Table 7-3 Frequency Error

Item	Specification	Unit	Remarks
Accuracy	≤±(10 + Reference signal)	Hz	GMSK
	≤±(15 + Reference signal)	Hz	8-PSK

Phase Error (GMSK)

Table 7-4 Phase Error

Item	Specification	Unit	Remarks
Input Level Range	–5 to +39	dBm	Burst wave: ≤ 4 timeslot/frame
Measurement Range	–20 to +20	º	
Resolution	0.1	º	
Accuracy	GSM850, GSM900: ≤±1.0 GSM1800, GSM1900: ≤±1.5	º	RMS
	GSM850, GSM900: ≤±4.0 GSM1800, GSM1900: ≤±6.0	º	PEAK

Burst Timing

Table 7-5 Burst Timing

Item	Specification	Unit	Remarks
Input Level Range	–5 to +39	dBm	Burst wave: ≤ 4 timeslot/frame
Measurement Range	–9.9 to +9.9	Bits	GMSK:1 symbol = 1 bit 8-PSK:1 symbol = 3 bit
Resolution	0.1	Bits	

BER, FER/BLER

Table 7-6 BER, FER / BLER

Item	Specification	Unit	Remarks
Input level range	–5 to 39	dBm	Burst wave: ≤ 4 timeslot/frame

Table 7-6 BER, FER / BLER

Item	Specification		Unit	Remarks
Sync range	BER(PN9fix)	0.00 to 99.99	%	
	BER(PN9)	0.00 to 25.00		
	BER(PN15)	0.00 to 33.00		
	FER	0.00 to 99.00		
Measurement	BER (BER IB,BER II)		—	GSM
	BER (Test Mode B)		—	GPRS
	FER		—	GSM
	FAST BER		—	GSM
	BLER (Ack/Nack)		—	GPRS, EGPRS

RX Quality

Table 7-7 RX Quality

Item	Specification	Unit	Remarks
Display Range	0 to 7	—	
Resolution	1	—	

RX Level

Table 7-8 RX Level

Item	Specification	Unit	Remarks
Display Range	0 to 63	—	
Resolution	1	—	

Actual Timing Advance

Table 7-9 Actual Timing Advance

Item	Specification	Unit	Remarks
Display Range	0 to 63	Bits	
Resolution	1	Bit	

Spectrum Monitor

Table 7-10 Spectrum Monitor

Item	Specification	Unit	Remarks
Input Level Range	–11 to +39	dBm	Burst wave: ≤ 4 timeslot/frame
Span	f_c to f_c + 400	kHz	Manual Test mode: f_c to f_c + 400 kHz (fixed)
	f_c ± 100	kHz	
RBW	10 or 30	kHz	
Display range (Vertical)	80	dB	Span: f_c to dc + 400 kHz
	80	dB	Span: f_c ±100 kHz
Accuracy	≤ ±2	dB	
Resolution	0.1	dB	
Noise level (P_{in} = 29 dBm)	≤–35	dB	Span0

Frequency Offset

Table 7-11 Frequency Offset

Item	Specification	Unit	Remarks
Range	f_c ±100	kHz	
Resolution	0.1	kHz	

AM Modulation

Table 7-12 AM Modulation

Item	Specification	Unit	Remarks
Modulation Frequency	1	kHz	
Degree of Modulation	83	%	

EVM (8-PSK, Option G03)

Table 7-13 EVM (8-PSK)

Item	Specification	Unit	Remarks
Input Level Range	–5 to +39	dBm	Burst wave: ≤ 4 timeslot/frame

Table 7-13 EVM (8-PSK)

Item	Specification	Unit	Remarks
Resolution	0.01	%	
Residual EVM	≤3.8	%	

Origin offset suppression (8-PSK, Option G03)

Table 7-14 Origin Offset suppression

Item	Specification	Unit	Remarks
Input Level Range	–5 to +39	dBm	Burst wave: ≤ 4 timeslot/frame
Measurement Range	≥20	dB	
Resolution	0.01	dB	
Residual Offset	≥40	dB	

Output RF Spectrum (8-PSK, Option G03)

Table 7-15 Output RF Spectrum

Item	Specification	Unit	Remarks
Input Level Range	0 to +39	dBm	Burst wave: ≤ 4 timeslot/frame
Measurement Point	fc – 400, fc + 400	kHz	
Resolution	0.01	dB	Burst wave: ≤ 4 timeslot/frame
Range	≤57	dB	

8
Appendix A Input Fields and Allowable Choices or Ranges

Here is a table of the input fields and allowable choices or ranges of values for test parameters and test items. This table is also useful for configuring the [Configuration: Test Sequence] and [Configuration: Test Condition] screens.

Table 8-1 Input Fields and Allowable Choices or Ranges

		Radio System			
Screen	**Item**	**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
Automatic Test	Procedure	Filename			
	BCCH	128 to 251 (824.2 to 848.8MHz)	955 to 124 (876.2 to 914.8MHz)	512 to 885 (1710.2 to 1784.8MHz)	512 to 810 (1850.2 to 1909.8MHz)
	TCH (Talk)	128 to 251 (824.2 to 848.8MHz)	955 to 124 (876.2 to 914.8MHz) 512 to 885 (1710.2 to 1784.8MHz)	512 to 885 (1710.2 to 1784.8MHz) 955 to 124 (876.2 to 914.8MHz)	512 to 810 (1850.2 to 1909.8MHz) 128 to 251 (824.2 to 848.8MHz)
	TCH	128 to 251 (824.2 to 848.8MHz)	955 to 124 (876.2 to 914.8MHz) 512 to 885 (1710.2 to 1784.8MHz)	512 to 885 (1710.2 to 1784.8MHz) 955 to 124 (876.2 to 914.8MHz)	512 to 810 (1850.2 to 1909.8MHz) 128 to 251 (824.2 to 848.8MHz)

Table 8-1 Input Fields and Allowable Choices or Ranges

		Radio System			
Screen	**Item**	**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
Manual Test (GSM)	Test Item	On | Off			
	Procedure	Filename			
	Radio System	GSM850 | GSM900 | DCS180 | PCS1900			
	BCCH	128 to 251 (824.2 to 848.8MHz)	955 to 124 (876.2 to 914.8MHz)	512 to 885 (1710.2 to 1784.8MHz)	512 to 810 (1850.2 to 1909.8MHz)
	TCH	128 to 251 (824.2 to 848.8MHz) 512 to 810 (1850.2 to 1909.8MHz)	955 to 124 (876.2 to 914.8MHz) 512 to 885 (1710.2 to 1784.8MHz)	512 to 885 (1710.2 to 1784.8MHz) 955 to 124 (876.2 to 914.8MHz)	512 to 810 (1850.2 to 1909.8MHz) 128 to 251 (824.2 to 848.8MHz)
	Timing ADV	0 to 63			
	PWR CNTL	2:+39dBm to 19:+5dBm	2:+39dBm to 19:+5dBm	29:+36dBm to +15:0dBm	30:+33dBm to 15:+0dBm
	BS Level	–110.0 to –50.0 dBm			
	Loop Test	A|C			
	Averaging	Off | 2 to 200			
	BER BS Lev	–110.0 to –50.0 dBm			
	BER Frames (Test Loop = A)	1 to 13000			
	Fast BER Frames (Test Loop = C)	1 to 13000			
	RBW	10 | 30 kHz			
	Con Mode	Talk | Test			

Table 8-1 Input Fields and Allowable Choices or Ranges

		Radio System			
Screen	**Item**	**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
Manual Test (GPRS)	Measurement Item	On | Off			
	Procedure	Filename			
	Radio System	GSM850 | GSM900 | DCS1800 | PCS1900			
	BCCH	128 to 251 (824.2 to 848.8MHz)	955 to 124 (876.2 to 914.8MHz)	512 to 885 (1710.2 to 1784.8MHz)	512 to 810 (1850.2 to 1909.8MHz)
	PDTCH	128 to 251 (824.2 to 848.8MHz) 512 to 810 (1850.2 to 1909.8MHz)	955 to 124 (876.2 to 914.8MHz) 512 to 885 (1710.2 to 1784.8MHz)	512 to 885 (1710.2 to 1784.8MHz) 955 to 124 (876.2 to 914.8MHz)	512 to 810 (1850.2 to 1909.8MHz) 128 to 251 (824.2 to 848.8MHz)
	Coding Scheme	1 to 4			
	PWR CNTL	2: 39dBm to 19:5dBm	2:39dBm to 19:5dBm	29:36dBm to 15:0dBm	30:33dBm to 15:0dBm
	BS Level	–110.0 to –50.0 dBm			
	Measur Slot	2 to 4			
	Test Mode	A|B|ACK			
	Averaging	Off | 2 to 200			
	Sens BS LV	–110.0 to –50.0			
	BLER Frames (Test Mode = ACK)	1 to 13000			
	BER Frames (Test Mode = B)	1 to 13000			
	Slot Config.	1×1 | 2×1 | 2×2 | 3×1 | 3×2 | 4×1			

Table 8-1 Input Fields and Allowable Choices or Ranges

		Radio System			
Screen	**Item**	**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
Manual Test (EGPRS)	Measurement Item	On | Off			
	Procedure	Filename			
	Radio System	GSM850 | GSM900 | DCS1800 | PCS1900			
	BCCH	128 to 251 (824.2 to 848.8MHz)	955 to 124 (876.2 to 914.8MHz)	512 to 885 (1710.2 to 1784.8MHz)	512 to 810 (1850.2 to 1909.8MHz)
	PDTCH	128 to 251 (824.2 to 848.8MHz) 512 to 810 (1850.2 to 1909.8MHz)	955 to 124 (876.2 to 914.8MHz) 512 to 885 (1710.2 to 1784.8MHz)	512 to 885 (1710.2 to 1784.8MHz) 955 to 124 (876.2 to 914.8MHz)	512 to 810 (1850.2 to 1909.8MHz) 128 to 251 (824.2 to 848.8MHz)
	Coding Scheme	MCS1 to MCS9			
	Puncturing Scheme	P1 to P3			
	Inc Redund	On|Off			
	PWR CNTL	2: +39 dBm to 19:+5 dBm	2:+39 dBm to 19:+5 dBm	29:+36 dBm to 15:0 dBm	30:+33 dBm to 15:0 dBm
	BS Level	–110.0 to –50.0 dBm			
	Slot Config.	1×1 | 2×1 | 2×2 | 3×1 | 3×2 | 4×1			
	Measur Slot	2 to 4			
	Test Mode	A|B|SRB|ACK			
	Averaging	Off | 2 to 200			
	Sens BS LV	–110.0 to –50.0			
	BLER Frames (Test Mode = ACK)	1 to 13000			

Table 8-1 Input Fields and Allowable Choices or Ranges

		Radio System			
Screen	**Item**	**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
TX Analyzer	Measurement Item	On | Off			
	Procedure	Filename			
	Radio System	GSM850 | GSM900 | DCS1800 | PCS1900			
	RFCH	128 to 251 (824.2 to 848.8MHz)	955 to 124 (876.2 to 914.8MHz)	512 to 885 (1710.2 to 1784.8MHz)	512 to 810 (1850.2 to 1909.8MHz)
	Signal	Burst | CW			
	Modulation	BCCH |GMSK: PN9 |GMSK: PN15 | GMSK: All0 | GMSK: All1 | 8PSK: PN9 | 8PSK: PN15			
	Offset	–100.0 to +100.0			
	PWR CNTL	2:+39dBm to 19:+5dBm	2:+39dBm to 19:+5dBm	29:+36dBm to +15:0dBm	30:+33dBm to 15:+0dBm
	Amplitude	–110.0 to –20.0			
	Midamble	None | TSC0 | TSC1 | TSC2 | TSC3 | TSC4 | TSC5 | TSC6 | TSC7			
	Averaging	Off | 2 to 200			
	Demod	GMSK | 8PSK			
	EVM Meas. Count	1 to 200			
	Measur Range	Auto			
	Span	0-400kHz | +-100kHz			
	RBW	10 | 30			
Signal Generator	Procedure	Filename			
	Radio System	GSM850 | GSM900 | DCS1800 | PCS1900			
	RFCH	128 to 251 (869.2 to 893.8MHz)	955 to 124 (921.2 to 959.8MHz)	512 to 885 (1805.2 to 1879.8MHz)	512 to 810 (1930.2 to 1989.8MHz)
	Amplitude	–110.0 to –20.0			
	Modulation	Off | GMSK: BCCH |GMSK: PN9 |GMSK: PN15 | GMSK: All0 | GMSK: All1 | 8PSK: PN9 | 8PSK: PN15			
	Offset	–100.0 to +100.0			

Table 8-1 Input Fields and Allowable Choices or Ranges

			Radio System			
Screen	**Item**		**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
Configuration (Top Menu)	Reference		Internal | External			
	Serial Port	Baud Rate	9600 | 19200 | 38400 | 57600 | 115200			
		Data Length	7 | 8			
		Stop Bits	1 | 1.5 | 2			
		Parity	None | Odd | Even			
		Xcontrol	None | Xon/Xoff			
	Ethernet	IP Addr	0.0.0.0. to 255.255.255.255			
		Mask	0.0.0.0. to 255.255.255.255			
	Gateway		ACT/NONE			
		Addr	0.0.0.0. to 255.255.255.255			
	GP-IB	Address	1 to 15			
		EOI	On | Off			
	Terminator		CR | LF | CR+LF			
	Date/Time	YYYY	1990 to 2037			
		MM	01 to 12			
		DD	01 to 31			
		HH	00 to 23			
		MM	00 to 59			
	Printer		USB Memory | EPSON PM-G800			
	Beeper		Off | On			
	AutoBoot	Application	None | GSM | WCDMA			
		Timer	10 to 60			

Table 8-1 Input Fields and Allowable Choices or Ranges

			Radio System			
Screen	**Item**		**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
Configuration	Procedure		Filename			
	Panel Key		Lock | Unlock			
	Serial Port	Baud Rate	9600 | 19200 | 38400 | 57600 | 115200			
		Data Length	7 | 8			
		Stop Bits	1 | 1.5 | 2			
		Parity	None | Even | Odd			
		Xcontrol	None, Xon/Xoff			
	Ethernet	IP Addr	0.0.0.0. to 255.255.255.255			
		Mask	0.0.0.0. to 255.255.255.255			
	GP-IB	Address	1 to 15			
		EOI	On | Off			
	Terminator		CR | LF | CR+LF			
	Date/Time	YYYY	1990 to 2037			
		MM	01 to 12			
		DD	01 to 31			
		HH	00 to 23			
		MM	00 to 59			
	Loss:		On | Off			
		RF In	0.0 to 99.9			
		RF Out	0.0 to 99.9			
	Printer		USB Memory | EPSON PM-G800			
	Beeper		Off | On			

Table 8-1 Input Fields and Allowable Choices or Ranges

			Radio System			
Screen	**Item**		**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
Test Sequence	Sequence No 1		GSM850 | GSM900 | DCS1800 | PCS1900			
	Sequence No 2		------- | GSM850 | GSM900 | DCS1800 | PCS1900			
	Sequence No		1 | 2			
	No 2 and 6 in the Test Sequence table		MS Call | BS Call			
	No 5 and 7 in the Test Sequence table		MS Release | BS Release			
	Sequence No1 Location Update Execute/Skip selection		Lu1|---			
	Sequence No2 Location Update Execute/Skip selection		Lu1|---			
	Other Execute/Skip selection		Run | ---			
	RF Output		Auto | On			
	Release Delay		0 to 9 sec			
	BCCH		128 to 251 (824.2 to 848.8MHz)	955 to 124 (876.2 to 914.8MHz)	512 to 885 (1710.2 to 1784.8MHz)	512 to 810 (1850.2 to 1909.8MHz)
	TCH		128 to 251 (824.2 to 848.8MHz) 512 to 810 (1850.2 to 1909.8MHz)	955 to 124 (876.2 to 914.8MHz) 512 to 885 (1710.2 to 1784.8MHz)	512 to 885 (1710.2 to 1784.8MHz) 955 to 124 (876.2 to 914.8MHz)	512 to 810 (1850.2 to 1909.8MHz) 128 to 251 (824.2 to 848.8MHz)
	Att:	Att In	–9.9 to +9.9			
		Att Out	–9.9 to +9.9			

Table 8-1 Input Fields and Allowable Choices or Ranges

		Radio System			
Screen	**Item**	**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
Test Condition	Radio System	GSM850 | GSM900 | DCS1800 | PCS1900			
	GSM Mode	GSM | GPRS|EGPRS			
	Network: MCC	000 to 999			
	MNC	00 to 99			
	NCC	0 to 7			
	LAC	0 to 65535			
	BS_PA_MFR MS	2 to 9			
	MS Power Class	2 to 5		1 to 3	
	PWR CNTL: High Mid Low Manual Test	2:+39dBm to 19:+5dBm	2:+39dBm to 19:+5dBm	29:+36dBm to 15:0dBm	30:+33dBm to 15:0dBm
	Averaging	Off | 2 to 200			
	Data	PN9 | PN9Fix | PN15			
	BER BS Level (Sens BSLV for GPRS/EGPRS)	–110.0 to –50.0 dBm			
	Loopback Delay	Short | Mid | Long			
	Signaling Pattern	1 to 255			
	PWR CNTL for Peak TX Power	2:+39dBm to 19:+5dBm	2:+39dBm to 19:+5dBm	29:36dBm to 31:32dBm 0:30dBm to 15:0dBm	30:+33dBm to 31:32dBm 0:30dBm to 15:0dBm
	Peak TX Power	–99.9 to +99.9 (LO Limit) –99.9 to +99.9 (HI Limit) (Set for each PWR CNTL)			
	Burst Timing	–9.9 to +9.9 (LO Limit) –9.9 to +9.9 (HI Limit)			
	Phase Error: RMS	0.0 to +99.9 (HI Limit)			
	Phase Error: Peak	(LO Limit depends on HI Limit setting) –99.9 to +99.9 (HI Limit)			
	Frequency Error	–99999 to +99999 (LO Limit) –99999 to +99999 (HI Limit)			

Table 8-1 Input Fields and Allowable Choices or Ranges

			Radio System			
Screen		**Item**	**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
	GSM Mode	BER BS Level		–110.0 to –50.0 dBm		
		BER Frames		1 to 13000		
		Fast BER Frames		1 to 13000		
		Loop-back delay		Short | Mid | Long		
		LocUpdate Delay		0 to 9 sec		
		Test Loop		A | C		
		Sens/BER Class Ib:		0.00 to 99.99 (HI Limit)		
		Sens/BER Class II:		0.00 to 99.99 (HI Limit)		
		Sens/Fast BER		0.00 to 99.99 (HI Limit)		
		Sens/FER		0.00 to 99.99 (HI Limit)		
		RX Quality		0 to 7 (LO Limit) 0 to 7 (HI Limit)		
		RX Level		0 to 63 (LO Limit) 0 to 63 (HI Limit)		
	GPRS Mode	BLER Frames		1 to 13000		
		BER Frames		1 to 13000		
		Coding Scheme		1 to 4		
		BLER BS Level		–110.0 to –50.0 dBm		
		Test Mode		A | B|ACK		
		Sens/BLER		--- (LO Limit) 0.00 to 99.99 (HI Limit)		
	EGPRS Mode	EVM Meas Count		1 to 200		
		BLER Frames		1 to 13000		

Table 8-1 Input Fields and Allowable Choices or Ranges

		Radio System			
Screen	**Item**	**GSM850**	**GSM900**	**DCS1800**	**PCS1900**
	Coding Scheme	MCS1 to MCS9			
	Puncturing Scheme	P1 to P3			
	Inc Redund	On | Off			
	Test Mode	ACK | A | B | SRB			
	EVM Limit (RMS)	--- (LO Limit) 0.00 to 99.99 (HI Limit)			
	EVM Limit (Peak)	--- (LO Limit) 0.00 to 99.99 (HI Limit)			
	EVM Limit (95%)	--- (LO Limit) 0.00 to 99.99 (HI Limit)			
	Origin Offset Spr.	--- (LO Limit) 0.0 to 99.9 (HI Limit)			
	Sens/BLER	--- (LO Limit) 0.00 to 99.99 (HI Limit)			
	ORFS Limit (ORFS. Mod)	--- (LO Limit) 0.0 to 99.9 (HI Limit)			
	ORFS Limit (ORFS. Sw)	--- (LO Limit) 0.0 to 99.9 (HI Limit)			
File Management	File Name	Arbitrary character string			
	Comments	Arbitrary character string			

9
Appendix B General Information in the GSM System

The GSM System 9-2

For your reference, some major information in the GSM system is described in this appendix.

The GSM System

A GSM mobile phone transmits speech as bursts of encoded data. An RF carrier is modulated by the special form of frequency modulation known as the Gaussian Minimum Shift keying (GMSK). Signals are transmitted in short bursts (577 ms each) using the method called Time Division Multiple Access (TDMA) on Absolute RF Channels (ARFCNs) spaced 200 kHz apart.

RF Channels

Table 9-1 shows the RF channel frequencies and channel numbers for each radio standard.

Table 9-1 RF Channels

	GSM850	GSM900	DCS1800	PCS1900
Uplink	824.2 to 848.8 MHz	890.2 to 914.8 MHz 876.2 to 889.8 MHz	1710.2 to 1784.8 MHz	1850.2 to 1909.8 MHz
Downlink	869.2 to 893.8 MHz	935.2 to 959.8 MHz 921.2 to 934.8 MHz	1805.2 to 1879.8 MHz	1930.2 to 1989.8 MHz
ARFCN Range	128 to 251	0 to 124 955 to 1023	512 to 885	512 to 810

Power Classes

The power classes are defined as follows:

Table 9-2 Power Classes

	1	2	3	4	5
GSM850, GSM900		+39 dBm	+37 dBm	+33 dBm	+29 dBm
DCS1800	+30 dBm	+24 dBm	+36 dBm		
PCS1900	+30 dBm	+24 dBm	+33 dBm		

Power Control Levels

The power control levels, RF power levels and permissible tolerances are shown below:

Table 9-3 Power Control Levels

#	GSM850, GSM900		DCS1800		PCS1900	
29			+36 dBm	±2 dB		
30			+34 dBm	±3 dB	+33 dBm	±2 dB
31			+32 dBm	± 3 dB *	+32 dBm	±2 dB *
0			+30 dBm	±3 dB	+30 dBm	± 3 dB
1			+28 dBm	±3 dB	+28 dBm	±3 dB
2	+39 dBm	±2 dB	+26 dBm	±3 dB	+26 dBm	±3 dB
3	+37 dBm	±3 dB *	+24 dBm	±3 dB *	+24 dBm	±3 dB *
4	+35 dBm	± 3 dB	+22 dBm	±3 dB	+22 dBm	±3 dB
5	+33 dBm	±3 dB *	+20 dBm	±3 dB	+20 dBm	±3 dB
6	+31 dBm	±3 dB	+18 dBm	±3 dB	+18 dBm	±3 dB
7	+29 dBm	±3 dB *	+16 dBm	±3 dB	+16 dBm	±3 dB
8	+27 dBm	±3 dB	+14 dBm	±3 dB	+14 dBm	±3 dB
9	+25 dBm	±3 dB	+12 dBm	±4 dB	+12 dBm	±4 dB
10	+23 dBm	±3 dB	+10 dBm	±4 dB	+10 dBm	±4 dB
11	+21 dBm	±3 dB	+8 dBm	±4 dB	+8 dBm	±4 dB
12	+19 dBm	±3 dB	+6 dBm	±4 dB	+6 dBm	±4 dB
13	+17 dBm	±3 dB	+4 dBm	±4 dB	+4 dBm	±4 dB
14	+15 dBm	±3 dB	+2 dBm	±5 dB	+2 dBm	±5 dB
15	+13 dBm	±3 dB	+0 dBm	±5 dB	+0 dBm	±5 dB
16	+11 dBm	±5 dB				
17	+9 dBm	±5 dB				
18	+7 dBm	±5 dB				
19	+5 dBm	±5 dB				

* This shall be ±2 dB when the power level corresponds to the power class of the mobile phone.

RX Level

The RX levels are defined as follows:

Table 9-4 RX Level

#	RX Level	#	RX Level	#	RX Level
0	≤110 dBm	22	–89 to –88 dBm	44	–67 to –66 dBm
1	–110 to –109 dBm	23	–88 to –87 dBm	45	–66 to –65 dBm
2	–109 to –108 dBm	24	–87 to –86 dBm	46	–65 to –64 dBm
3	–108 to –107 dBm	25	–86 to –85 dBm	47	–64 to –63 dBm
4	–107 to –106 dBm	26	–85 to –84 dBm	48	–63 to –62 dBm
5	–106 to –105 dBm	27	–84 to –83 dBm	49	–62 to –61 dBm
6	–105 to –104 dBm	28	–83 to –82 dBm	50	–61 to –60 dBm
7	–104 to –103 dBm	29	–82 to –81 dBm	51	–60 to –59 dBm
8	–103 to –102 dBm	30	–81 to –80 dBm	52	–59 to –58 dBm
9	–102 to –101 dBm	31	–80 to –79 dBm	53	–58 to –57 dBm
10	–101 to –100 dBm	32	–79 to –78 dBm	54	–57 to –56 dBm
11	–100 to –99 dBm	33	–78 to –77 dBm	55	–56 to –55 dBm
12	–99 to –98 dBm	34	–77 to –76 dBm	56	–55 to –54 dBm
13	–98 to –97 dBm	35	–76 to –75 dBm	57	–54 to –53 dBm
14	–97 to –96 dBm	36	–75 to –74 dBm	58	–53 to –52 dBm
15	–96 to –95 dBm	37	–74 to –73 dBm	59	–52 to –51 dBm
16	–95 to –94 dBm	38	–73 to –72 dBm	60	–51 to –50 dBm
17	–94 to –93 dBm	39	–72 to –71 dBm	61	–50 to –49 dBm
18	–93 to –92 dBm	40	–71 to –70 dBm	62	–49 to –48 dBm
19	–92 to –91 dBm	41	–70 to –69 dBm	63	≥48 dBm
20	–91 to –90 dBm	42	–69 to –68 dBm		
21	–90 to –89 dBm	43	–68 to –67 dBm		

RX Quality

The RX quality is defined as follows:

Table 9-5 RX Quality

#	RX Quality	#	RX Quality
0	<0.2 %	4	1.6 to 3.2 %
1	0.2 to 0.4 %	5	3.2 to 6.4 %
2	0.4 to 0.8 %	6	6.4 to 12.8 %
3	0.8 to 1.6 %	7	>12.8 %

Limits for BER and FER

The permissible limits for BER and FER are defined as follows:

Table 9-6 Limits for BER and FER

RF Level	Mobile Phone	BER	FER
-100 dBm	all	0.00 %	
-102 dBm	P>2 W	<2.44 %	
-104 dBm	P≤2 W	<2.44 %	<0.10 %

Limits for Frequency Error

The permissible limits for the Frequency Error are defined as follows:

≤0.1 ppm

THIS PAGE IS INTENTIONALLY LEFT BLANK

10
Appendix C CAU-17 Antenna Coupler

Introduction 10-2
Specifications 10-2
Operating the Antenna Coupler 10-3

This chapter describes information of the Agilent CAU-17 Antenna Coupler.

Introduction

Agilent Technologies CAU-17 Antenna Coupler enables you to make the RF connection easily between the mobile phone and the Agilent N9360A Multi UE Tester.

The purpose of this guide is to provide you with the information on the Agilent CAU-17 Antenna Coupler. This section contains the following:

- The specifications of the Agilent CAU-17 Antenna Coupler
- Tester for operating the Agilent CAU-17 Antenna Coupler with the Agilent N9360A Multi UE Tester.

Specifications

This section lists the specifications of the Agilent CAU-17 Antenna Coupler. These specifications are the performance standards and limits against which the CAU-17 is tested. When shipped from the factory, the CAU-17 meets the following specifications:

- Operation Frequency Range:

  824 MHz to 960 MHz, 1710 to 1880 MHz, and 1880 to 1990 MHz

- Coupling Factor:

  15 dB (at 824 MHz to 960 MHz; supplemental characteristics)

  13 dB (at 1710 MHz to 1880 MHz; supplemental characteristics)

  11 dB (at 1880 MHz to 1990 MHz; supplemental characteristics)

- Connector Type:

  N-type (male)

- Operating Temperature:

  0 to 40 ºC

- Storage Temperature:

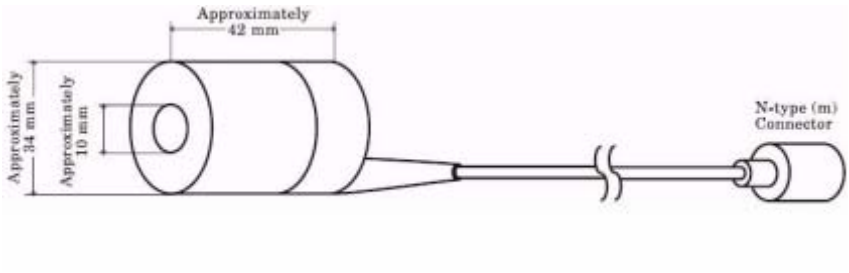
  –20 to 60 ºC

- Dimension:

  Outside Diameter: approximately 34 mm

  Inside Diameter: approximately 10 mm

Length: approximately 42 mm



Operating the Antenna Coupler

1. If the antenna of the mobile phone can be stretched, fully stretch the antenna.
2. Connect the Antenna Coupler to the RF IN/OUT connector of the Agilent N9360A Multi UE Tester.
3. Insert the antenna into the hole of the Antenna Coupler pushing the Antenna Coupler down to the root of the antenna.

NOTE

Make sure that the coupler is always placed exactly at the same position for each test with the same type antenna. Only in this way can consistent test conditions and test results be assured.

4 Set the attenuation (loss) values on the [Configuration] screen. Refer to Entering Loss in Configuration on page 19.